""TO DETERMINE THE PERSONALITY TRAITS, CLINICAL CHARACTERISTICS AND COGNITIVE FUNCTIONS IN BIPOLAR DISORDER PATIENTS WITH COMORBID ALCOHOL USE DISORDERS"

Dissertation submitted to

THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY

in partial fulfilment of the requirements for

M. D (PSYCHIATRY)

BRANCH XVIII

MADRAS MEDICAL COLLEGE,

CHENNAI.

APRIL 2015

CERTIFICATE

This is to certify that the dissertation titled, **"TO DETERMINE THE PERSONALITY TRAITS, CLINICAL CHARACTERISTICS AND COGNITIVE FUNCTIONS IN BIPOLAR DISORDER PATIENTS WITH COMORBID ALCOHOL USE DISORDERS"** is the bonafide work of **Dr. AHALYA. T**, submitted in partial fulfilment of the requirements for M.D. Branch – XVIII [Psychiatry] examination of The Tamilnadu Dr. M. G. R. Medical University, to be held in April 2015.

The Director,
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CERTIFICATE of GUIDE

This is to certify that the dissertation titled, **"TO DETERMINE THE PERSONALITY TRAITS, CLINICAL CHARACTERISTICS AND COGNITIVE FUNCTIONS IN BIPOLAR DISORDER PATIENTS WITH COMORBID ALCOHOL USE DISORDERS"** is the original work of **Dr. AHALYA. T**, done under my guidance submitted in partial fulfilment of the requirements for M.D. Branch – XVIII [Psychiatry] examination of The Tamilnadu Dr. M. G. R. Medical University, to be held in April 2015.

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DECLARATION

I, **Dr. AHALYA. T.**, solemnly declare that the dissertation titled, **"TO DETERMINE THE PERSONALITY TRAITS, CLINICAL CHARACTERISTICS AND COGNITIVE FUNCTIONS IN BIPOLAR DISORDER PATIENTS WITH COMORBID ALCOHOL USE DISORDERS",** is a bona fide work done by me at the Institute of Mental Health, Chennai, during the period from August 2014-September 2014 under the guidance and supervision of **Dr. JEYAPRAKASH. R., M.D., D.P.M**, Professor of Psychiatry, Madras Medical College.

The dissertation is submitted to The Tamilnadu Dr. M. G. R. Medical University towards partial fulfilment of requirement for M.D. Branch XVIII [Psychiatry] examination.

Place:

Date:

Dr. AHALYA. T.

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INSTITUTIONAL ETHICS COMMITTEE
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CERTIFICATE OF APPROVAL

To
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Dear Dr. AHALYA. T,

The Institutional Ethics Committee has considered your request and approved your study titled " **TO DETERMINE THE PERSONALITY TRAITS, CLINICAL CHARACTERISTICS AND COGNITIVE FUNCTIONS IN BIPOLAR DISORDER PATIENTS WITH COMORBID ALCOHOL USE DISORDERS" No. 01082014.**

The following members of Ethics Committee were present in the meeting held on **05.08.2014** conducted at Madras Medical College, Chennai-3.

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We approve the proposal to be conducted in its presented form.
The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

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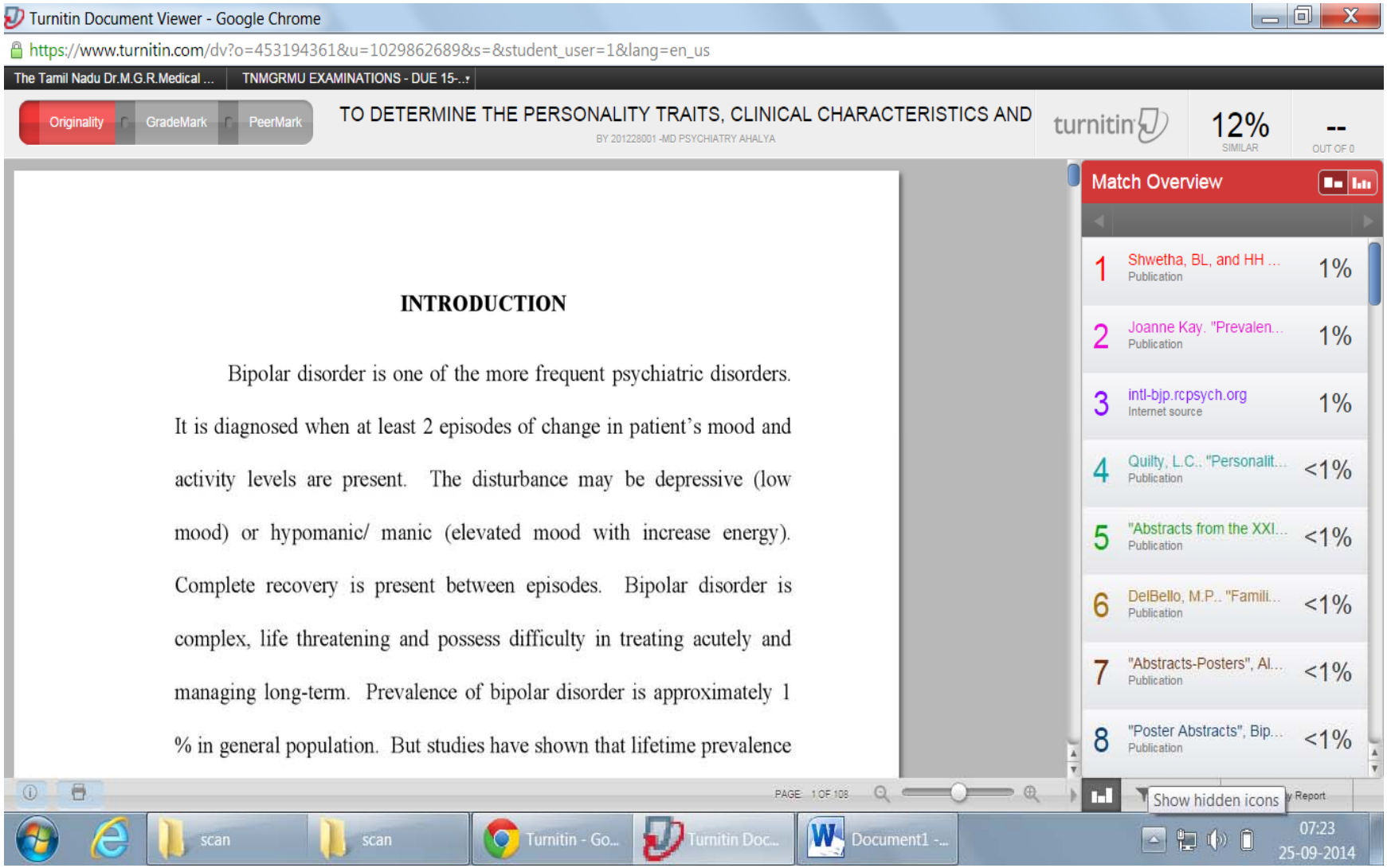
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INTRODUCTION
Bipolar disorder is one of the more frequent psychiatric disorders. It is diagnosed when at least 2 episodes of change in patient's mood and activity levels are present. The disturbance may be depressive (low mood) or hypomanic/ manic (elevated mood with increase energy). Complete recovery is present between episodes. Bipolar disorder is complex, life threatening and possess difficulty in treating acutely and managing long-term. Prevalence of bipolar disorder is approximately 1 % in general population. But studies have shown that lifetime prevalence
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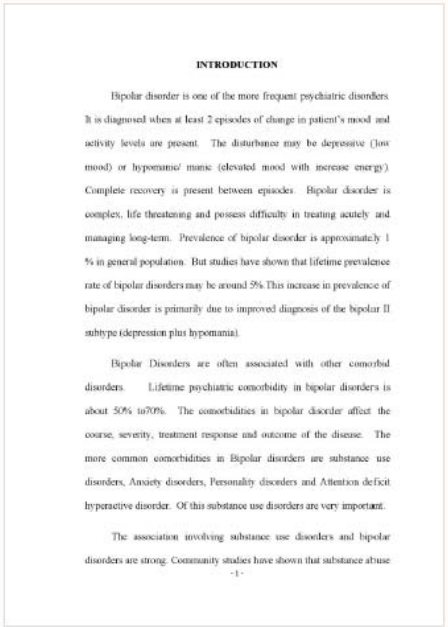

INTRODUCTION

Bipolar disorder is one of the more frequent psychiatric disorders. It is diagnosed when at least 2 episodes of change in patient's mood and activity levels are present. The disturbance may be depressive (low mood) or hypomanic/ manic (elevated mood with increase energy). Complete recovery is present between episodes. Bipolar disorder is complex, life threatening and possess difficulty in treating acutely and managing long-term. Prevalence of bipolar disorder is approximately 1 % in general population. But studies have shown that lifetime prevalence rate of bipolar disorders may be around 5%.This increase in prevalence of bipolar disorder is primarily due to improved diagnosis of the bipolar II subtype (depression plus hypomania).

Bipolar Disorders are often associated with other comorbid disorders. Lifetime psychiatric comorbidity in bipolar disorders is about 50% to70%. The comorbidities in bipolar disorder affect the course, severity, treatment response and outcome of the disease. The more common comorbidities in Bipolar disorders are substance use disorders, Anxiety disorders, Personality disorders and Attention deficit hyperactive disorder. Of this substance use disorders are very important.

The association involving substance use disorders and bipolar disorders are strong. Community studies have shown that substance abuse

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ABBREVIATIONS

Alcohol use disorder identification test	AUDIT
Alcohol use disorders	AUD
Bipolar disorder	BPD
California verbal learning test	CVLT
Digit Symbol Substitution test	DSST
Frontal Lobe Assessment Battery	FAB
Rey auditory verbal learning test	RVLT
Schedule for Assessment in Neuropsychiatry	SCAN
Severity of Alcohol Dependence Questionaire	SADQ
Wechler’s memory scale	WMS

"TO DETERMINE THE PERSONALITY TRAITS, CLINICAL CHARACTERISTICS AND COGNITIVE FUNCTIONS IN BIPOLAR DISORDER PATIENTS WITH COMORBID ALCOHOL USE DISORDERS"

ABSTRACT

BACK GROUND:

Comorbidity of bipolar disorder and substance use disorder are common. In bipolar disorder with comorbid Alcohol use disorder the disease course is more severe and difficult to treat. Bipolar patients with history of alcohol use have greater difficulties in cognitive functions than those without alcohol use. Whether alcohol negatively affects specific cognitive functions or whether deficits are more diffuse in nature is unclear. Alcoholic bipolar patients present with personality traits like high novelty seeking and neuroticism. Personality, at least to an extent, mediates the co-occurrence of substance use in bipolar disorder. Thus identifying these personality traits in bipolar or substance use disorder patients will help us to prevent the co-occurrence of the 2nd disorder.

Aim:

The aim of the study is to evaluate the clinical characteristics, personality traits and cognitive functions of patients with Bipolar and comorbid alcohol use disorders.

Methodology:

A case–controlled study was designed with 50 male patients with Bipolar and alcohol use disorder enrolled in the case group and 50 male patients with bipolar disorder selected as the control group. A semi structured questionnaire was used to measure demographic characteristics. alcohol status was measured using AUDIT and SADQ scales. Personality traits were measured using MEO –FFI questionnaire. cognitive tests – Frontal lobe assessment battery, Stroop test DSST and verbal N back test were given to cases and

controls.. Descriptive statistics, Chi square test, ANOVA and correlation statistics were used to analyse socio-demographic data, Personality traits, clinical features and cognitive functions between both the groups.

Results:

The cases group had significantly more no. of hospitalizations and mixed episodes than control group. The cases group scored significantly higher on the personality traits of neuroticism and novelty seeking. The cases group had significantly poorer performance on cognitive tests of FAB, Stroop test and digit symbol substitution test. duration of alcohol use was associated positively with total no. of episodes, no. of manic episodes, no. of mixed episodes and no. of hospitalizations. These results show that cognitive deficits were more prominent with the severity of dependence.

Conclusion:

The study confirmed the high prevalence of neuroticism and openness to experience traits in bipolar with alcohol use disorders. The study also showed that No. of hospitalizations and No. of mixed episodes were more The study also showed that there are increased deficits in executive functions, response inhibition and processing speed in bipolar patients with comorbid alcohol use disorders.

Keywords: bipolar affective disorder, alcohol, cognitive functions, personality traits.

INTRODUCTION

Bipolar disorder is one of the more frequent psychiatric disorders. It is diagnosed when at least 2 episodes of change in patient's mood and activity levels are present. The disturbance may be depressive (low mood) or hypomanic/ manic (elevated mood with increase energy). Complete recovery is present between episodes. Bipolar disorder is complex, life threatening and possess difficulty in treating acutely and managing long-term. Prevalence of bipolar disorder is approximately 1% in general population. But studies have shown that lifetime prevalence rate of bipolar disorders may be around 5%. This increase in prevalence of bipolar disorder is primarily due to improved diagnosis of the bipolar II subtype (depression plus hypomania).

Bipolar Disorders are often associated with other comorbid disorders. Lifetime psychiatric comorbidity in bipolar disorders is about 50% to70%. The comorbidities in bipolar disorder affect the course, severity, treatment response and outcome of the disease. The more common comorbidities in bipolar disorders are substance use disorders, anxiety disorders, personality disorders and attention deficit hyperactive disorder. Of this substance use disorders are very important.

The association between substance use disorders and bipolar disorders are strong. Community studies have shown that substance abuse

and dependence particularly alcohol are more common in bipolar disorder than in general population. At times, substance abuse may arise as a symptom of bipolar disorder and at times occur as an attempt by bipolar patients to self-medicate symptoms. Substance abuse might cause bipolar disorder or there might be a common risk factor for both. Comorbidity of substance dependence and abuse is much greater in bipolar disorder than unipolar depression. The prevalence is also higher than Schizophrenia. Bipolar disorders co-occur with alcohol dependence than with abuse. This shows that the severity of alcohol use related disorders are more and disabling when they occur in bipolar disorder patients.

Alcohol use related disorders have a damaging effect on the course of bipolar disorders. Alcohol use related disorders significantly complicate the onset, course, treatment and prognosis of bipolar disorder which results in increased distress, disability, and expenditure. When substance use related disorders co-occur with bipolar disorder, the duration of hospital stay and suicidal attempts are increased. There is also poor adherence to treatment and poor response to de-addiction programme for substance abuse. Hence substance use disorders lead to poor prognosis in bipolar disorder. And also bipolar disorder patients show poor response to de-addiction treatment. On the contrary, bipolar disorder may be a risk factor for precipitating substance use disorders.

Poorer performances on cognitive functions are exhibited by bipolar disorder and substance use related disorder patients even in euthymic and abstinent states respectively. The performance is poorer when bipolar disorder co-occurs with substance use. The performance is poor particularly in areas of memory and executive functions.

Several studies have shown characteristic personality traits in patients with bipolar disorder and substance use related disorder independently. There are very few studies which analysed specific personality traits in bipolar disorder with co-morbid substance use related disorders. These studies suggest that personality, at least to an extent, mediates the co-occurrence of substance use in bipolar disorder. Thus identifying these personality traits in bipolar or substance use disorder patients will help us to prevent the co-occurrence of the 2nd disorder.

REVIEW OF LITERATURE:

BIPOLAR DISORDER:

Bipolar mood disorders are a class of psychiatric disorders that are mostly episodic and are distressing for the patient in case of depressive episode or the caregiver in case of manic episode. The disorder cause unusual shifts in mood, energy and activity levels. Person with the disorder have difficulty to carry out daily activities of life. The severe symptoms of bipolar disorder leads to break in relationships, unemployment, harm to self and others and in younger age group poor academic achievements.

Bipolar disorder has a tendency to occur among family members. Few researches have suggested that people with particular genes are more likely to develop bipolar disorder than others. Persons with history of bipolar disorder in mother, father, brother or sister are more prone to develop the disease, as compared to persons without a family history of bipolar disorder.

The risk for bipolar disorder is not restricted to genes alone. Twin studies have shown that in monozygotic twins, though they shared genes bipolar disorder did not always occur. Other studies also propose that in addition to genes other factors may also play a role in the evolution of

disease. Many different environmental factors and genes are postulated as risk factors for bipolar disorder.

Bipolar disorder patients undergo unusual extreme emotional states that take place in discrete periods called "mood episodes". Each mood episode will be a total change from the person's previous mood and behaviour. An excess of cheerfulness/ joy/ excitement is found in a manic episode. An overt sad/ hopeless state is found in a depressive episode. When symptoms of manic excitement and depression are present at the same time, it is called a mixed episode. Irritability during a bipolar mood episode is more common particularly during mania. Dramatic changes in energy level, psychomotor activity, sleep pattern, and behaviour occur during mood episodes.

COMORBIDITIES IN BIPOLAR DISORDER:

Comorbidity is the occurrence of dual diagnosis in the same patient. The diagnosis of one disorder does not rule out the diagnosis of the second disorder. When one disorder influences the course, prognosis, treatment response and outcome of the second disorder it is called clinical co-morbidity. Co-morbidity in bipolar disorders can be medical or psychiatric[1].

The Psychiatric Comorbidities that are prevalent in bipolar disorders include:

1. Anxiety disorder 71 %
2. Substance use disorder 56 %
3. Alcohol abuse 49 %
4. Social phobia 47 %
5. Other drug abuse 44 %
6. PTSD 39%
7. Personality disorder 36 %
8. Binge-eating disorder 13 %
9. Panic disorder 11 %
10. OCD 10 %

The Medical Comorbidities that are prevalent in bipolar disorders include:

1. Overweight 58 %
2. Migraine 28 %
3. Obesity 21%
4. Type 2 diabetes 10 %
5. Hypothyroidism 9%

SUBSTANCE USE RELATED DISORDERS IN BIPOLAR DISORDERS:

Bipolar Disorders and alcohol use related disorders co-occur more frequently. The frequency is more than expected by chance alone. The higher rate of co-occurrence of bipolar mood disorder and substance use related disorders, necessities the screening for the other disorder when the individual presents for treatment of one disorder. This is important since early detection and treatment will improve the treatment outcomes in either disorder.

The co-occurrence of bipolar disorder and substance use disorders is important clinically since comorbidity has a negative influence on the onset, progress, treatment response and prognosis of both the disorders[2].

Diagnostic difficulty

Accurately diagnosing and differentiating substance use related disorders and bipolar disorder is a very difficult task. Occasionally the complex relationship between mood symptoms and substance related symptoms might lead to difficulty in diagnosis of both the disorders. Some patients with bipolar disorders might be self-medicating with the substances to reduce the symptoms of the bipolar disorder. Prolonged and

excessive intake of alcohol might precipitate bipolar disorder in a genetically predisposed person. This particularly happens to persons who use stimulant as an addictive substance. Intoxicated and withdrawal states of substance use can mimic mood disorders. Substance induced symptoms or mood disorder symptoms can be differentiated by observing the patient during abstinence of substance. The abstinence duration required for diagnosis differs according to the substance abused. In persons taking long acting benzodiazepines, withdrawal symptoms disappear only after several weeks of abstinence. Short acting benzodiazepines, alcohol and cocaine require shorter duration of abstinence. The diagnosis of mood disorder is likely when there is family history of mood disorder, onset of symptoms is before substance use and symptoms presence during lengthy periods of abstinence.

Prevalence of substance use disorders in bipolar disorders

Bipolar disorders are common and severe disorders occurring in 1.3 to 1.7% of general community[3-4]. Prevalence of substance use related disorders is also common in general population. Life time prevalence rate in general population is about 17% for alcohol use disorders and 6% for other substance related disorders[3]. The dual diagnosis of bipolar disorder and substance use related disorder was

reviewed by Kessler[5]. In a sample of 20,291 from general population, Reiger found lifetime prevalence of substance use disorders in 61% of persons diagnosed as Bipolar I disorder, 48% diagnosed as bipolar II disorder, 27% diagnosed as Major depressive disorder, 47% diagnosed as schizophrenia and 17% in general population[3]. The prevalence of alcohol use related disorders occurring in bipolar patients was 46% and it was higher than for other substances combined which was 41%. But the relative risk of substance use related disorders in bipolar patients was greater for other substances than for alcohol[3].

Prevalence in Bipolar I and Bipolar II disorders:

A study on the effect of substance use disorders on the type of bipolar disorder that is Bipolar I and II disorders was done by Chenngapah N. He found that in bipolar 1 disorder, 57.8% of subjects were dependent on/ abused one or more substances, 28.2% of subjects were dependent on/ abused two or more substances, and 11.3% of subjects were dependent on /abused three or more substances. In bipolar II disorders, the percentage was 39% for one or more substances, 17% for two or more substances, and 11% for three or more substances. It was found that alcohol was the most common substance abused[6].

Substance use disorder or bipolar disorder. Which came first?

In a community sample of 8098, Kessler et al found that in people with history of Manic episode, the odds of alcohol abuse was 0.3, of alcohol dependence was 9.7, of drug abuse was 1.2, of drug dependence was 8.4 and any substance use disorder was 6.8[7]. He also noted that in bipolar disorder patients, mood symptoms either preceded or occurred simultaneously with substance use disorders. Grant et al., in a community sample of 43,093 found that after excluding substance induced mood disorders, the 12 month prevalence of substance use was 1.7% for mania and 1.2% for hypomania. There was no significant difference between hypomania and mania. But when persons with 12 month history of substance use disorders were considered, the prevalence of mania and hypomania was 4.9% and 3.3% respectively. Among the Bipolar disorder patients odds were high for substance dependence than abuse. Also odds were high for manic episode than hypomanic episode[8]. The above two studies, Kessler et al (Bipolar disorder precede substance use disorder) and Grant et al (few cases of substance induced mood disorders) suggest association between bipolar disorder and substance use related disorder in most cases is not secondary to mood effects of substances abused.

Risk factors for comorbid occurrence of substance abuse/ dependence disorders in bipolar disorder:

Comorbid illness:

In patients with Bipolar disorder, the risk factors identified by Sonne et al were low level of education, male gender and another co-occurring psychiatric illness[9]. Thus presence of another psychiatric comorbidity increases risk of alcohol use disorders. Particularly, anxiety disorder which frequently occurs in bipolar disorder increases the risk of development of substance use disorders[10]. Bipolar disorder patients with adult ADHD experience the maximum risk for developing substance use disorders[11].

Impulsivity:

Nery FG et al., studied trait impulsivity in bipolar disorder patients diagnosed with and without alcohol use related disorders. He found higher scores in total and subscales of Baratt Impulsiveness scale in bipolar patients with alcohol use than patients without alcohol use. Alcohol dependent bipolar patients had higher score on impulsiveness than alcohol abuse patients. Bipolar disorder patients with alcohol and another drug use disorders had higher non-planning impulsivity than bipolar disorder patients with alcohol use alone. He postulated increased

impulsivity as trait marker for comorbidity of bipolar disorder and alcohol use disorders[12]. In another study Etain B et al., demonstrated association between trait impulsiveness in bipolar disorder and history of substance abuse, severe clinical expression of disease and rapid cycling mixed episodes. But he found that impulsiveness was not associated with substance abuse characteristics[13]. But few studies showed that substance use related disorders in Bipolar disorder patients may not result from impulsivity or self-medication[14].

Episodes:

In bipolar disorders, the mood can be manic, depressed, mixed or euthymic. Meyer TD et al., found increased alcohol intake when depressed or manic than when euthymic. Drinking motives were negative internal coping in depression and Positive internal and external coping in mania[15]. The substance and its level of use vary with mood state. During mania, Estroff et al., noted a trend towards polysubstance and amphetamine use[16]. Sonne et al., found more of cocaine use in depression and alcohol use in mania[9]. In certain clinical trials, strong association between cocaine use and change in depressive rather than manic symptoms were noted[17-18]. Alcohol related outcomes were strongly related to change in manic symptoms than depressive symptoms. Study by Strakowski et al., showed that alcohol use duration was associated

with duration of depression and cannabis use duration was associated with duration of mania[19]. Certain studies also showed strong association between dysphoric or mixed mania and substance use than euphoric mania[9, 20-22].

Causes of substance use disorders in patients with bipolar disorder:

There are three likely explanations for powerful association between substance use disorder and bipolar disorder.

1. Bipolar disorder causes substance use related disorders
2. Substance use related disorders cause bipolar disorders
3. Bipolar disorders and substance use related disorders have common origin

Since in bipolar disorder and substance use disorders the age of onset is early and detection of onset of mood symptoms is difficult, it is often difficult to know which occurred first. If the first of the postulation is correct then the treatment of bipolar disorder would result in effective treatment of substance use disorders. Bipolar disorder patients can use substance, due to their mood state during episode. They can also use it due to greater exposure to the substance due to homelessness and other psychosocial changes caused by the disease.

If second postulation is correct, then onset of substance use must be before mood episode. But this does not occur in all the patients with both the disorders[23]. Kenneson et al., in a study found that in a sample of 5217 subjects with substance use disorders, subsequent development of mood disorders were 26.4% between 12-17yrears of age, 21.7% between 18-25 years and 14% between 26-34 years. The time between substance use and mood disorder onset was on average 11 years. Dependence had higher odds of developing mood disorder than abuse. Bipolar disorder occurrence was high in dependence group. This study shows that individuals in the age group of less than 25 years have increased chance of developing secondary mood disorder[24]. But Grand et al., found higher prevalence of substance use disorders in bipolar patients after excluding substance induced mood disorder.

There is some evidence for the third postulate. Substance use related disorder has a common origin with bipolar disorders as shown by genetic similarities of the two disorders. But few studies done on the first degree relatives of patients diagnosed with bipolar disorder, showed increase in the rate of occurrence of bipolar disorder and not substance use related disorders. This does not explain the third postulate.

McDonald JL et al., discussed the cognitive motivational models and hypothesis on self-medication with alcohol for dual diagnosis in

community. His findings supported that bipolar disorder patients used alcohol as self medication, as a means to relieve mood state that are distressing. But the study had several limitations[25].

Effect of substance use disorder on bipolar disorder:

On clinical characteristics:

When substance use disorders co-occur with bipolar disorders, the duration of hospital stay, suicidal attempts is increased and there is poor adherence to treatment and poor response to substance abuse treatment. In a study of 392 bipolar patients hospitalised with manic and mixed episodes, Cassidy et al., found significant association between lifetime substance use disorders and number of hospitalizations[26]. Other studies have not replicated the findings. In bipolar disorder patients with cocaine, fewer hospitalizations were found by Musser et al[27].

Suicide attempts:

In a study by Potash et al., on bipolar disorders with substance use disorders and alcohol dependence suicide attempts were present in 38% as against 22% with no substance or alcohol use[28]. They also found evidence for inheritance of genetic traits that may lead to bipolar disorder, alcohol dependence and suicide attempts. Scott H et al., found higher

incidence of aggression and violence in bipolar patients with substance use[29]. In a sample of 7819 diagnosed with bipolar mood disorder or schizoaffective disorder or major depressive disorder, Comtois et al., found significant association between current use of substance and lifetime suicidal attempts, recent suicidal attempts, suicidal ideation at admission[30].

Non-adherence to treatment:

In a follow up study of 134 patients of Bipolar disorders for 1 year post hospitalization for manic or mixed episode, Keck et al., found significant association between non-adherence to treatment and comorbid substance use disorders. 58% of patients without comorbidity adhered to treatment as compared to 32% who were treatment non adherent[31]. In a retrospective study by Goldberg et al., it was found that treatment non-adherence was found in 53% of bipolar disorder patients with comorbid substance abuse as against 35% without substance use[94]. In particular, non-adherence to treatment with lithium was significantly present in bipolar disorder patients using substance in a study by Asgaard et al. and Vestergaard et al.[32].

Treatment adherence:

Significant adherence to treatment with sodium valproate than lithium was found in bipolar patients with substance use by Weiss et al[33]. Saxon AJ et al., suggested that Bipolar disorder patients in de-addiction treatment had greater substance use, frequent suicidal ideation and aggressive episodes than alcohol use disorders without mood disorder[34]. Regarding age of onset of mood episodes in patients with both the diagnosis of bipolar disorder and substance use disorders, no consistent reports have been obtained. Winkokur et al., found that onset of mood episodes in subjects with dual diagnosis was early. Whereas Strakwoski et al., found no association of early onset in dually diagnosed subjects. But on the contrary illness onset was late[35, 36].

Treatment Considerations in co-occurring Bipolar disorder and Substance use disorders:

It has been proved that non-pharmacologic treatments have been effective for bipolar and disorders due to substance use. It is important for several reasons. It helps to increase the ability to regulate subjective state of oneself and build up the confidence through behavioural therapy to recovered individuals. The ability to regulate oneself helps the patients to

avoid using substances to combat intolerable subjective states by helping them to acquire effective coping strategies.

PERSONALITY IN BIPOLAR DISORDERS WITH COMORBID SUBSTANCE USE DISORDERS

Definition of personality:

Maddi (1996) described personality as, a set of characters and tendencies that determine the common things and differences in people's behaviour (thoughts, feelings and actions), that are present continuously and are not easily understood as the only result of the social and biological pressures of the particular moment[37]. Tendency refers to the process that gives directions to thoughts, feelings and actions; while characteristics refer to static personality structures used to explain goals or requirements.

Definition of personality traits:

According to McCrae and Costa[38], traits are the dimensions of individual differences in the tendency to show constant patterns of thought, feelings and actions. Traits are hence inherited, endogenous basic tendencies which develop through childhood to reach a mature form in adulthood, stabilise in individuals that are cognitively sound. Traits are

expressed through various acts and they lead people to develop entirely new behaviours. For example, fast driving or taking drugs can be a result of excitement-seeking trait.

The five different personality traits described by Barrick, Mount and Judge are:

1. Neuroticism: defined as presence of anxiety, depression, hostility and personal insecurity in a person
2. Extraversion: defined as presence of sociability, ambition, dominance, positive emotionality and excitement-seeking in a person.
3. Openness to experience: defined as presence of intelligence, creativity, unconventionality and broad mindedness in a person.
4. Agreeableness: defined as presence of cooperation, trustfulness, compliance, affability in a person.
5. Conscientiousness: defined as presence of dependability, achievement striving and planfulness in a person.

Five Factor Models of personality traits

The Five Factor Model (FFM) of personality is the extensively used current model and it is the accepted comprehensive dimensional personality model as described by Goldberg (1990)[39]. In the Five Factor

Model of personality the personality variation is understood in terms of the five domains: Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness. The tendency to experience negative affects and cognitions is neuroticism. Extraversion includes sociability, assertiveness and enthusiasm. Openness to experience involves aesthetic flexibility and intellectual curiosity. Agreeableness includes trust, compassion and cooperativeness. Conscientiousness involves orderliness, meticulousness, and determination. The personality traits of the Five Factor Model are heritable (Reifand Lesch, 2003; Ebstein, 2006)[40], and are associated with different health outcomes and treatment response. The Five Factor Model of personality traits is etiologically related to factors like vulnerability factors and associated features; in spite of this, they can be significantly utilised in clinical assessment and treatment[41].

Personality of an individual develops early and it is stable. It has strong heritability. Personality traits as factors are implicated in the predisposition to bipolar disorders. Identifying the personality trait of an individual helps us to differentiate major depressive disorder, bipolar I and bipolar II subtypes. Adequate description of personality in patients with bipolar disorder is necessary to identify traits to help us to understand bipolar disorder.

Personality trait in bipolar disorder

Studies have been done to investigate if personality traits could make an individual vulnerable and if it could predict onset in depression and bipolar disorder (vulnerability hypothesis). The possibility that personality might be altered by mood disorder was also studied (scar hypothesis). But the association between bipolar disorder and personality was unclear. Neuroticism was identified as a probable risk factor. Bipolar patients are associated with elevated scores on neuroticism than normal subjects[41]. Individuals with neurotic traits could be identified and this will help us to identify individuals at risk of developing mood disorder and help in preventing the occurrence of the disease[42]. Other studies have also showed high scores of neurotic personality traits associated with bipolar disorder. They have identified that trait of neuroticism may be a marker of bipolar disorder[43].

Inheritance and personality traits in bipolar disorder:

Study conducted to compare the personality traits in bipolar I disorder patients, their siblings and normal controls, showed that bipolar disorder patients scored higher on harm avoidance, novelty seeking and self-transcendence as compared to healthy controls and siblings which were statistically significant. Siblings scored higher on harm avoidance when compared to normal controls. Bipolar disorder patients scored less

on self-directedness and cooperativeness than the other two groups. Siblings when compared to healthy controls scored less on self-directedness[44].

Personality traits in bipolar disorder Vs major depressive disorder:

In a study of personality traits and bipolar disorder, scores on neuroticism was positively related to bipolar disorder. Scores on conscientiousness was negatively related to bipolar disorder. In depression, scores on neuroticism was positively associated and extraversion and conscientiousness were negatively associated. In mania scores on neuroticism was positively associated and scores on agreeableness was negatively associated[41]. Onset of manic symptoms was associated with novelty seeking[45]. In his study James A Harley et al., reported high harm avoidance in both bipolar disorder and major depressive disorder. He postulated that high harm avoidance was characteristic of mood disorder. This was not exclusive to major depressive disorder or bipolar disorder[46]. Janowsky et al., also reported high scores on novelty seeking in patients with bipolar disorder compared to unipolar depression. The trend towards higher scores on novelty seeking was also found in bipolar II disorders. However his study did not support the suggestion that scores of low persistence was found in bipolar disorders.

Personality in Bipolar I Vs Bipolar II disorders:

In a comparative study between bipolar I and II disorders, bipolar II disorder patients, scored higher on neuroticism. Particularly the scores were higher in anxiety, depression, self-consciousness and vulnerability facets. As compared to bipolar I disorder, they scored lower on extraversion and its facet positive emotion. They also scored lower in competence and achievement-striving facets of conscientiousness trait. There was no significant difference between other dimensions[47].

Effect of personality on bipolar disorders:

Personality traits in bipolar disorders were studied by Mandelli L et al. The results showed that poor outcome of depression were associated with high scores of harm avoidance. Neurotic personality traits were associated with slow recovery from symptoms in bipolar disorder[48]. Neurotic traits or harm avoidance was associated with persistence of depressive symptoms[45]. In his study on influence of personality traits on the morbidity in bipolar I patients, Kim B et al found that neuroticism score was positively related to the total number of hospitalizations and hospitalizations for depression. A negative association was found between total hospitalisation and hospitalisation for depression and traits of Openness and Extraversion. In bipolar patients with mood switch from mania directly to depression without euthymic state, scores on

neuroticism were significantly higher than bipolar patients without mood switch. There was no significant association between personality traits and admissions for manic episode[49]. Majority of bipolar patients receive multiple medications. Some benefit from skilful management of complex medications. But mostly complex medications do not lead to expected improvement and is expensive. They also alter the assessment of mood disorders. Greater risks of ineffective complex medication in bipolar patients have been identified in patients with certain personality traits. Patients with more current psychotropic medications, scored low on openness trait. Patients with high lifetime medication use scored low on extraversion and conscientiousness. Thus low scores on openness, extraversion and conscientiousness may be associated with multiple drug therapy in bipolar patients[50].

Personality traits and comorbidity in bipolar disorder:

The role of personality traits and occurrence of comorbidity in bipolar disorder have not been extensively studied. In a comparative study between bipolar disorder, Major depressive disorder and healthy controls it was found that, in bipolar patients personality traits of neuroticism, conscientiousness and extraversion was significantly associated with comorbidity of ADHD. A low level of neuroticism was associated with lower frequency of ADHD[51].

In a study done to determine the possibility of role of personality traits towards the comorbidity of substance abuse in bipolar disorder patients, two groups: bipolar disorder without history of substance related disorder and bipolar disorder with substance related disorders were compared. Results showed that novelty seeking statistically differed between the two groups. Bipolar disorder patients with current substance related disorders had higher scores on novelty seeking than bipolar disorder patients with past substance related disorders. Novelty seeking was confirmed as a predicting variable to both past history and current substance related problems in bipolar disorder patients[52].

In a study conducted to determine underlying personality trait variations in alcohol dependence and abuse patients, with and without mood comorbidity, it was found that dual diagnosis was associated with higher scores on neuroticism and lower scores on extraversion than alcohol related disorder alone. Dual diagnosis patients when compared to normal subjects were more introverted and had more sensing, feeling and perceiving preferences. Patients who had single diagnosis of Alcohol use disorder generally were similar to normative group except that they more often had sensing preference.

NEUROCOGNITIVE FUNCTIONS

Cognition denotes “a relatively high level of processing specific information such as thinking, memory, motivation, perception, language and skilled movements”.

Campbell’s psychiatric dictionary says, among the specific functions that determines the adequacy and intactness of cognition are orientation, new learning ability, problem solving, abstract thinking, reasoning and judgment, retention and recall ability, mathematical ability and manipulation of symbols, self control over primitive behaviours, comprehension and use of language, attention, perception and praxis.

Deficits in cognition may result in the areas of

1. Attentiveness.
2. Quick information process.
3. Recall of events.
4. Response to information.
5. Critical thinking, planning, organizing and solving problems.
6. Speech initiation

There is an extremely wide range of neurocognitive deficits but the most frequently compromised cognitive functions are executive functions, working memory, and attention.

Attention impairment

Attention is a composite of skills that includes maintenance of an alert state, selectively filtering the significant information, shifting from one set to other, orienting to new stimuli. Attention is reduced in normal people in sleep, dreams, hypnotic states, fatigue, and boredom. It may be pathologically reduced in organic states, epilepsy, and in psychogenic states, it may be altered, narrowing of attention is also prominent in depression. Severe deficit in attention is a feature of hyperkinetic disorder. Lack of attention and concentration indicates an inability to focus on an object in a purposeful way implying weakening of the determining tendency, which is a feature of mania and hypomania. In psychosi,s variation of external perception is associated with change of attention. Selected tests for attention include Digit span, Visual memory span, Digit vigilance test, Paced auditory serial addition test[53].

Memory impairment

Memory disturbance can be divided into those that are psychogenic, sometimes occurring in healthy people and those that are organic, associated with the disease of the brain. Various researches indicate that specialized processing of verbal and spatial memory materials tends to be differentially mediated by the left and right

hemispheres respectively. Verbal learning includes the abilities concerned with acquiring new knowledge, retention of the newly acquired information and recognition of the earlier learned information. Some of the tests for memory are WMS, CVLT, RVLT, Benton visual retention test and Rey complex figuretest[53].

Executive dysfunction

The term executive function refers to the various neurocognitive functions that are concerned with the prefrontal cortex like planning, problem solving and alternating between two or more tasks. Executive function is concerned etiologically in many psychiatric illnesses. Wide research and assessment have been done regarding cognitive developmental disorders, psychiatric disorders, affective disorders, conduct disorders as well as neurodegenerative disorders and traumatic brain injury. Tests for executive dysfunction includes WCST, Stroop word colour interference test, Trail making tests and Category test[53].

Verbal fluency

There are two categories of verbal fluency namely phonological fluency and semantic fluency. The former denotes the patient's capability to think as many words as possible starting with a specific letter in a

limited time. Semantic fluency denotes the patient's capability to think of words with a similar meaning (eg. animals, fruits). Tests include Boston diagnostic aphasia examination, Boston naming test, Token test and COWA test[53].

Cognitive dysfunctions in mood disorders:

The relationship between mood and cognition are variable ones, certain components are trait-dependent and quite a few components are state-dependent. The nature of trait characteristics of cognitive manifestations are static and they provide insight into brain abnormalities that give rise to mood disorders. Specific neural systems might be responsible for cognitive dysfunctions in bipolar disorders.

Studies on specific cognitive impairments in mood disorders have not given consistent results. Both unipolar and bipolar patients showed dysfunction in tests of attention, executive function and memory. Symptom severity correlated with level of cognitive functions. Cognitive deficits persist even in euthymic states. This indicates that there might be some cognitive processing deficits which represent fundamental trait characteristics.

Literature and studies on the neurocognition in bipolar disorder demonstrate numerous cognitive impairments in bipolar disorder patients when compared with healthy controls.

It has been recognized for a long time that mania is associated with changes in affect and cognition. (Kraepelin, 1921; Bunney and Hartman, 1965)[54]. The most consistent findings are deficits in the areas of attention, verbal memory and executive function (Quraishi and Frangou, 2002; Malhi, Ivanovski, Szekers and Olley, 2004)[55, 56]. Simonsen et al., in his report demonstrates that one-fourth of patients with type I bipolar disorder has a range of clinically significant cognitive impairment. Savard et al., administered the Halstead-Reitan category test to acutely depressed unipolar and bipolar patients who were naïve of medications and showed that patients in bipolar group made significantly more errors[57]. Marked impairment in test of learning and verbal fluency was demonstrated by Wolfe et al. in a group of bipolar disorder patients compared to unipolar depressive patients[58]. Taylor and Abrams (1986) showed almost 50% of patients with mania had moderate to severe global cognitive impairment in tests of attention, visuospatial function and memory[59].

A study by Henry et al.(1971) reported that there is impairment in serial word list learning in manic phase. He also demonstrated that the

reduction in performance was directly related to increase in severity of illness[60].

Cognitive impairment in manic phase of bipolar disorder was also proven by Murphy et al.,(1999) in tests of spatial recognition and pattern memory and visual recognition delay[61]. "The memory structure of manic patients compared to normal controls, where loose, over inclusive and idiosyncratic which led to difficulties in filtering the environmental stimuli and a tendency to over generalize" (Andreason and Powers, 1974)[62]. Also studies show impairment in executive functioning in manic patients by using set shifting tests (Morice,1990; Clark et al.,2000), ability to plan (Murphy etal.,1999) and decision making (Clark et al.,2000;Murphy et al.,2001)[63, 64].

Neurocognition in euthymic phase of bipolar disorder

It was assumed that bipolar disorder patients regain intact cognition after their recovery from an acute episode, but this has been disproved by recent studies, which show there is neuropsychological dysfunction in euthymic phase of bipolar disorder as well. Malhi et al., 2005 studied 12 bipolar patients in their euthymic phase comparing with 12 normal controls and concluded that bipolar patients show cognitive impairment in their euthymic phase.

Van Gorp et al. (1998) employed rigorous criteria for euthymic state in 13 bipolar disorder patients and matched them with a control sample of 22 on areas of general intellectual quotient and educational level[65]. He found that deficits in executive and verbal memory in euthymic phase of bipolar patients. Ferrier et al. (1999) in a study sample of 41 bipolar patients in euthymic state and 20 healthy controls, found residual executive functional impairment in euthymic bipolar patients, after matching for age and intelligence at premorbid state[66].

Rubinsztein et al. (2000) found that patients with bipolar disorder in the inter episodic period when they had no symptoms for at least 4 months showed deficits in of visuospatial memory tests and response latency in tests of executive functioning[67].

Sapin et al., found impairment in facial recognition compared with normal controls when he studied 20 bipolar patients who were euthymic for 4 weeks and drug free for 2 weeks[68].

Cavanagh et al., in a study of 20 euthymic bipolar patients vs 20 normal controls and Clark et al., in a study of 30 euthymic bipolar patients vs 30 healthy controls found neurocognitive deficits on areas of verbal learning and memory in euthymic bipolar patients[69,70].

Deficits in both verbal learning and executive function was reported by Thompson et al., (2000) in a prospective study of 63 euthymic bipolar patients and 63 controls with similar mood state in similar clinical sittings[71].

Similar findings were demonstrated by Zubieta et al. (2001) on measures of verbal learning, executive function and motor coordination which were impaired in bipolar patients (n=15) in their euthymic state when compared to 15 normal controls[72].

A study by Taj M. and Padmavathy et al. (2005) from Schizophrenia research centre, Chennai, showed impairment in the areas of attention, memory, executive function in euthymic bipolar patients, in their study comparing 30 euthymic bipolar patients and 30 controls[73].

Number of Affective Episodes in Bipolar Illness and Degree of Cognitive Dysfunction when Euthymic[74]

Correlates of Number of Manic Episodes Deficits in:

a. Episodic memory;
b. Verbal learning and memory;
c. Executive functioning

Correlates of Number of Depressive Episodes Deficits in:

a. Attention, CVLT, Tower of London, and Spatial Working memory
b. Reaction time in backward masking procedure
c. Executive functioning (WCST)

Correlates of Total Number of Episodes Deficits in:

a. Abstraction
b. Attention
c. Verbal memory

Studies done on bipolar disorder patients to assess impairment in executive functioning in euthymic state using frontal lobe assessment battery showed impairment particularly in areas of sensitivity to interference and inhibitory control. There was no significant difference in the other subsets.

Cognition in substance abuse

Excessive alcohol use has been associated with global neurological changes like reduced cerebral blood flow, cerebral atropy and altered neurotransmitter activity. These changes cause cognitive deficits in the individual. These changes most commonly impact the functions of prefrontal and temporal regions[75].

In moderate drinking, immediate learning is impaired in acute state. In heavy consumption, inability to recall events while intoxicated occurs. In 10% of alcoholics persistent memory impairment occurs. Frequent consumption of large quantities of alcohol rather than lifetime drinking is the highest risk for cognitive deficits in alcohol use disorders.

In detoxified patients within 2-4 weeks, cognitive deficits occur in areas of problem solving, abstract reasoning and learning and recall. Verbal functioning is within normal limits. Over a period of few weeks considerable recovery occurs in verbal learning.

In detoxified patients, recovery of cognition continues for many months at a slower rate. Deficits persists is areas of non-verbal learning and memory, abstract reasoning and perceptual-motor abilities for months/ years. Slowest to resolve are the deficits in skills involving processing speed, novel problem solving and new learning ability. Long term recovery is influenced by factors like age, premorbid level of functioning, nutrition and comorbid conditions.

In another study done on substance-dependent individuals using the frontal assessment battery (FAB) neurocognitive deficits were found in executive domains of abstract reasoning, motor programming, and cognitive flexibility[76].

Cognitive dysfunction in bipolar disorder with alcohol use disorders[77, 78].

Various studies on neuropsychological research of bipolar disorder have established significant cognitive deficits persisting during euthymic state also[77]. Deficits are more pronounced after multiple episodes[78]. Similarly cognitive deficits occur in alcohol dependence which does not remit during abstinence[79].

Though cognitive dysfunction in bipolar disorder and alcohol use disorders have been studied extensively, studies on cognitive deficits in dual diagnosis conditions are rare. Studies reported additional decline in executive functioning in patients with dual diagnosis when compared to single diagnosis[65]. When Alcohol dependence occurs in bipolar disorder patients who already have cognitive deficits, alcohol leads to increased cognitive deficits that hamper the recovery from the disease.

Several explanations for the increased deficits in cognition of dually diagnosed patients have been made. First research suggests the long term neurotoxic effect of alcohol on cognitive function[80]. Second research suggests severe and prolonged mood episode to be associated with cognitive dysfunction in dually diagnosed individuals[81]. New studies have pointed towards the possibility of intrinsic neurocognitive deficits in

bipolar disorder existing prior to commencement of disease leading to mood instability and alcohol dependence[82].

In a study by Boez Levy et al., he found no significant differences on tests of attention and working memory in bipolar patients with and without use of alcohol. But he found significant differences in visual memory and not in verbal memory. But significant group differences were found in measures of executive functioning[83]. Another study showed similar findings but it showed significant deficit in verbal memory also. Poorer performance was noted on phoenemic fluency and response inhibition.

The current study was aimed at assessing the effect of alcohol on the disease outcome and cognitive deficits in bipolar disorder. It was also designed to identify the personality traits that may be unique to patients with dual diagnosis of bipolar disorder and alcohol use related disorders. The identification of personality traits in either of the disorder may help us to prevent the co-occurrence of the other disorder. This will reduce the disease severity and long term outcome in the patients. This will also reduce the cognitive deficits and improve the social performance of the individual.

AIMS AND OBJECTIVES

Aim:

The aim of the study is to

1. To evaluate the clinical characteristics of patients with Bipolar and comorbid alcohol use disorders.

2. To evaluate the cognitive functions in patients with Bipolar and comorbid alcohol use disorders.

3. To evaluate the personality traits in patients with Bipolar and comorbid alcohol use disorders.

NULL HYPOTHESIS:

1. There is no relationship between level and duration of alcohol use and the clinical characteristics of patients with bipolar disorder.
2. There is no relationship between level and duration of alcohol use and the personality traits of patients with bipolar disorder.
3. There is no relationship between level and duration of alcohol use and the cognitive functions in patients with bipolar disorder.
4. There is no difference in the educational status and marital status in bipolar disorder patients with and without comorbid alcohol use disorders.
5. There is no difference in the age of onset of illness in bipolar disorder patients with and without comorbid alcohol use disorders.
6. There is no difference in the duration of episode, total no. of episodes and no. of mixed episodes in bipolar disorder patients with and without comorbid alcohol use disorders.
7. There is no difference in the number of hospitalizations and suicide attempts in bipolar disorder patients with and without comorbid alcohol use disorders.
8. There is no difference in the personality traits in bipolar disorder patients with and without comorbid alcohol use disorders.
9. There is no difference in cognitive deficits in bipolar disorder patients with and without comorbid alcohol use disorders.

METHODOLOGY (MATERIALS & METHODS)

The study is a cross sectional observational case control study, conducted at the Institute of Mental Health, Chennai. Consecutive patients attending outpatient department were screened for diagnosis of bipolar disorder according to ICD 10 criteria using Schedules for Clinical Assessment in Neuropsychiatry (SCAN).

Selection Criteria:

CASES

Inclusion Criteria:

1. Patients with both bipolar and alcohol use related disorders diagnosed according to ICD-10
2. Age between 18-55 years
3. Patients in Euthymic state (6 months remission, HAM-D ≤8, YMRS≤6).
4. Patients currently not consuming alcohol for past 2 weeks.
5. Minimum of eight years of formal education.
6. Normal hearing and vision by history and clinical examination.
7. Patient and attender giving informed consent.

Exclusion Criteria:

1. Mentally retardation.
2. h/o previous ECT.
3. h/o Neurological illness/ any other psychiatric illness.
4. h/o any other substance abuse except smoking.

CONTROLS

Inclusion criteria:

1. Patients with Bipolar disorder diagnosed according to ICD-10.
2. Age between 18-55 years matched for sex and age with cases.
3. Patients in Euthymic state (6 months remission, HAM-D ≤8, YMRS≤6).
4. No h/o alcohol use.
5. Minimum of eight years of formal education.
6. Normal hearing and vision by history and clinical examination.
7. Patient and attender giving informed consent.

Exclusion criteria:

1. Mentally retardation
2. h/o previous ECT
3. h/o Neurological illness/ any other psychiatric illness
4. h/o any other substance abuse except smoking

TOOLS:

1. Schedule for clinical assessment in neuropsychiatry (SCAN)
2. Semistructured proforma to collect socio-demographic data and clinical characteristics of study (cases) and control group.
3. Alcohol use disorder identification test (AUDIT)
4. Severity of Alcohol Dependence Questionaire(SAD-Q)
5. NEO-Five Factor Inventory
6. Frontal Assessment Battery (FAB)
7. Digit symbol substitution test
8. Stroop word colour test
9. Verbal N back test

DESCRIPTION OF TOOLS:

1. **Schedules for Clinical Assessment in Neuropsychiatry (WHO, 1999)**[84]:

Schedules for Clinical Assessment in Neuropsychiatry (SCAN) are manuals created by the World Health Organization (WHO) for assessing, measuring and classifying the mental illnesses. It can be used in variety of settings like the clinical and research settings. This system has a bottom-up approach where diagnosis-driven frames are not applied in symptom clustering. Its stability and validity has been proven by various studies.

SCAN is a semi structured standardized clinical interview with provision for cross examination of the subject. There is no fixed order of the flow of the interview which makes this instrument flexible and versatile. Each section of the schedules starts with the important questions about the symptoms pertaining to that section. If these questions are answered positively, then the questions below the cut-off point are also asked to the patient.

2. **Semistructured proforma for socio demographic data and clinical characteristics:**

It is a semistuctured profoma to collect demographic details which includes age, education, occupation, Socioeconomic status, marital status, religion, language and domicile. Details regarding illness characteristics like age of onset of bipolar disorder, duration of illness in years, total number of episodes, total number of hospitalizations, number of suicide attempts, history of alcohol use, duration of alcohol use, age of beginning of alcohol use are collected.

3. **Alcohol Use Disorders Identification Test (AUDIT)**[85]

The AUDIT screening questionnaire is a simple questionnaire developed by WHO. It helps to identify persons with excessive drinking and recognizing hazardous and harmful patterns of alcohol consumption. Based on the scores of AUDIT, treatment intervention is planned. This provides a base for intervention and plan deaddiction programmes to help hazardous and harmful drinkers to stop alcohol consumption and prevent the harmful consequences of their drinking.

The Questionnaire has 10 questions. 1st to3rd questions are on alcohol consumption, 4th to 6th questions are on behaviour of drinking and

dependence and 7th to 10th questions are on the consequences or problems related to drinking.

• 1stto8th questions are scored from 0, 1, 2, 3 and 4on a five-point scale.

• 9th& 10th questions are scored from 0, 2 and 4on a three -point scale.

• The maximum score is 40.

A total score of 8 or above indicates a hazardous / harmful pattern of drinking.

4. SEVERITY OF ALCOHOL DEPENDENCE QUESTIONNAIRE (SADQ)[92]

The Addiction Research Unit at the Maudsley Hospital developed the Severity of Alcohol Dependence Questionnaire. The SADQ has 20 questions intended to measure the alcohol dependence severity. The following areas of dependence are analysed using SADQ questionnaire:

a. withdrawal symptoms-physical
b. withdrawal symptoms-affective
c. relief drinking
d. alcohol use frequency
e. time taken for withdrawal symptoms onset.

Scoring: Answers to each question are rated from 0 to 4 on a four-point scale from ‘never’ to ‘always’:

≥31 - "severe alcohol dependence".

16 -30 - "moderate dependence"

< 16 - mild physical dependency.

When a person scores above 16, detoxification is indicated.

5. NEO-Five Factor Inventory[86]

The short version, the NEO Five-Factor Inventory (NEO-FFI) is a 60-item scale. It was developed to provide quick and concise assessment of the five basic personality traits of Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness[86].

For each scale, 12 items were selected from the pool of 180 NEO Personality Inventory (NEO-PI) items, chiefly on the basis of their correlations with validimax factor scores (McCrae & Costa, 1989). The instrument uses a five-point Likert response format.

The original NEO Personality Inventory had scales to assess the traits of Neuroticism, Extraversion, and Openness only. Agreeableness and Conscientiousness were added latter. In 1992 Costa and McCrae published the 240-item NEO PersonalityInventory, Revised (NEO PI-R)[38]. In this extensive scale we can evaluate six facets for each of the five traits. The NEO PI-R scales have been validated and they have internal consistency, temporal stability, and convergent and discriminant

validity.Since the administration of NEO PI-R was time consuming, its use in research was limited. Hence Costa and McCrae (1992) developed the NEO-FFI which has only 60 items based on the1985 version of the NEO PI. Each trait had 12 items. The 12 items were selected based on the load of each item on five factors. The reliability of the scale was studied to be adequate across the five factors. The NEO-FFI scales were proved to inherit a major portion of the validity of the NEO PI-R scales.

6. Frontal lobe Assessment Battery[87]

The neuropsychological tool, Frontal Assessment Battery (FAB), was devised by Dubois et al[88]. It is short and helps in assessing executive functions at the bedside. The FAB has of six subtests, covering widely the functions of frontal lobes. Each subset has a score from 0 to 3. The maximum score is 18. A score of 12 or below is considered abnormal. Higher scores indicate better performance. Time taken to administer the battery is about 10 minutes. The functions analysed are

S.No.	Functions tested	Tests
1	conceptualization	similarities task
2	mental flexibility	phonological fluency task
3	motor programming	Luria's motor series
4	sensitivity to interference	conflicting instructions task
5	inhibitory control	go-no-go task
6	environmental autonomy	Prehension behaviour

1. Conceptualization:

In frontal lobe dysfunction, abstract reasoning is affected. Patient will not be able to make a similar abstract link between items tested.

2. Mental flexibility:

The non-routine functions that require cognitive strategies are disturbed in frontal lobe lesions. Fluency tasks require retrieval from semantic memory. Verbal fluency is reduced in frontal lobe dysfunctions. In this test, the individual tells from his memory the number of words possible with the given letter.

3. Motor programming:

Intact function of frontal lobe is required in tasks of temporal organization and carrying out successive actions. In Luria's motor series, such as "fist–palm–edge," the person needs to do the series in correct sequence without simplification like two gestures instead of three and perseveration.

4. Sensitivity to interference:

In tasks in where verbal commands contradict the sensory information, self regulation is required. When instructions are given to patient to act to the opposite of what they see, in frontal lobe dysfunction the patients could not refrain from sensory stimuli and fail to follow verbal command.

5. Inhibitory control:

It tests the ability of the person to withhold an inappropriate response. The go-no-go test assesses the ability of the individual to control the impulsiveness to act, that is to inhibit a act that was done to the same stimuli previously.

6. Environmental autonomy:

Patients with frontal lobe dysfunction, has a spontaneous tendency to adhere to the environment. They lack the inhibitory response of the prefrontal cortex on the act triggered by certain sensory stimulations.

TEST FOR SPEED OF PROCESSING:

The tests for speed of processing can be divided into two types, namely motor speed and mental speed. Mental speed is a composite measure which needs rapid information processing. In any modality, even for simple stimulus, information processing speed depends on the coordination of different brain circuits. The measurement of mental speed is used to document the efficiency of the rate of information processing.

7. **Digit symbol substitution test**[89]

It is a test for visual motor coordination, motor persistence and most importantly response speed. The test consists of sheet in which numbers 1 – 9 are randomly arranged in 4 rows of 25 squares each. The subject substituted each number with a symbol using number symbol key given on the top of the page. The test sheet was placed in front of the person and asked to perform the test after explaining it. The first 10 squares are for practise. The time taken to complete the test forms the score. The number errors made are noted.

TESTS FOR WORKING MEMORY:

Working memory is capacity to withhold and manoeuvre information for ongoing processes. The 3 components of working memory are verbal working memory, visuospatial working memory and a central executive. Working memory is externally and internally guided.

Verbal working memory

8. **Verbal N – back test** (Smith and Jonides, 1999)[90]:

The N back tests used for verbal working memory, are the N1 back and N2 back versions. This test measures the externally guided working memory. In this test 30 randomly ordered consonants common to multiple Indian languages are presented vocally at one letter in 1 sec. A total of 9 consonants which are chosen randomly are repeated. In the N1 back test the subject has to respond when a consonant is repeated consecutively. In the N2 back test, the subject has to respond when a consonant is repeated after an intervening consonant. The number of hits and errors are scored. Errors included the number of omission and commission errors. The total number of errors was taken for computation.

RESPONSE INHIBITION

9. **Stroop test** (Alexander, Benson and Stuss, 1989)[91]:

This test measures the response inhibition ability. On a sheet, the names of colours "blue", "green", "red" and "yellow" are printed in capital letters. The colour of the print and the word printed might not match up. But occasionally both may correspond. The words are printed in 16 rows and 11 columns. The sheet will be placed in front of the individual to be tested. First the individual is asked to read the word and

not the colour of the word in column-wise as fast as possible. The examiner notes down the time taken in seconds to read all the 11 columns. Next, the individual is asked to name the colour in which the word is printed column wise. The examiner notes the time taken to name all the colours. The words were given in the mother tongue of the subject. Stroop effect score = Time taken to name – Time taken to read the words.

OPERATIONAL DESIGN:

This was a hospital based study, conducted at Institute of Mental Health, Madras Medical College, Chennai in a cross sectional comparative design, for a period of three months. Approval from the Institutional Ethical Committee, Madras Medical College was obtained.

The sample was chosen from psychiatry outpatient department of Institute of Mental Health. Patients diagnosed as bipolar disorder with alcohol use disorders as per ICD 10 were chosen as cases and patients diagnosed as bipolar disorder without alcohol use disorders as per ICD 10 were chosen as controls. All the cases and controls were screened depending on the inclusion and exclusion criteria, were included in the study.

The study subjects were explained about the nature of the study and consent was obtained. Socio demographic details as per proforma

collected from cases and controls. Complete physical examination including detailed Neurological evaluation was done. Subsequently, all subjects were given the scales and cognitive assessments as mentioned. Tests were administered in a quiet room in a fixed pre-set order according to standard administration instructions. The time taken was about 1hr to 1hr and 30 minutes. Assessments were carried out in 1-2 sessions, each session not extending beyond 1 hour.

STATISTICAL DESIGN:

Statistical design was formulated using the data collected as above, for each of the scales and socio-demographic variables the central values and dispersion were calculated for the two groups (bipolar patients with comorbid alcohol use disorders and without alcohol use disorders). In comparison of the data, chi-square test for categorical variables and student t test for numerical variables were used. The data was analyzed using the Statistical Package for the Social Sciences, version 20.0 for Windows. P value of < 0.05 was considered significant.

RESULTS

The results are discussed in the following aspects.

1. Descriptive analysis of Socio-demographic data
2. Comparison of Clinical Variables, Personality traits and scores of Cognitive function test between Cases (BPD &AUD) and Controls (BPD)
3. Comparison of Clinical Variables, Personality traits and scores of Cognitive function test within cases group between alcohol dependence and alcohol abuse groups.
4. Bivariate Analysis between Alcohol use related variables and socio-demographic data, clinical variables, personality traits and cognitive test variables

DESCRIPTIVE ANALYSIS

Total No of Cases (BPD & AUD) =50

Total No. of Controls (BPD) =50

Within cases Total No. of cases with alcohol dependence pattern=33

Within cases Total No. of cases with alcohol abuse pattern=17

All subjects in both cases and controls were of male sex.

DESCRIPTIVE ANALYSIS OF SOCIO DEMOGRAPHIC DATA

Independent samples t-Test to compare age between cases and controls (Table 1)

Variable	Cases / controls	N	Mean	Std. Dev	t-value	p-value
Age	BPD & AUD	50	37.4	7.6	1.664	.099
	BPD	50	34.7	8.1		

The mean age of subjects in the cases (BPD & AUD) group was 37.4 years. The mean age of subjects in control (BPD) group was 34.7 years

Table 1 shows that there was no significant statistical difference between cases and controls in age and both groups are comparable by age.

SOCIODEMOGRAPHIC DETAILS

Table 2

Religion	Cases		controls			
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
Hinduism	47	94.0	45	90.0	92	92.0
Christianity	3	6.0	3	6.0	6	6.0
Islam	0	.0	2	4.0	2	2.0
Total	50	100.0	50	100.0	100	100.0

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Table 3

Domicile	Cases		Controls			
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
Urban	22	44.0	32	64.0	54	54.0
Semi-urban	17	34.0	13	26.0	30	30.0
Rural	11	22.0	5	10.0	16	16.0
Total	50	100.0	50	100.0	100	100.0

Table 4

Language	Cases		Controls			
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
Tamil	49	98.0	49	98.0	98	98.0
Telugu	1	2.0	1	2.0	2	2.0
Total	50	100.0	50	100.0	100	100.0

Tables 2-4 shows on comparison of both the groups, both groups predominantly followed Hinduism, were from urban background with Tamil as their mother tongue

Socio-demographic Variables compared using Chi-square test between cases and controls. (Table 5)

Variable	**Value**	**df**	**Asymp 2 tail sig**
Religion	2.043	2	.360
Language	.000	1	1.000
Domicile			

Table 5 shows that on comparison of socio-demographic variables religion, language and domicile using Chi-square test there was no statistical significance between the groups.

Chi-Square test to compare proportions of Socioeconomic status between cases and controls (Table 6)

SES	Cases/ controls					
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
Lower	32	64.0	35	70.0	67	67.0
Lower middle	9	18.0	2	4.0	11	11.0
Middle	9	18.0	13	26.0	22	22.0
Total	50	100.0	50	100.0	100	100.0
P Value = 0.070						

Table 6 shows that on comparison of socio-economic status using Chi-square test there was no statistical significance between the groups.

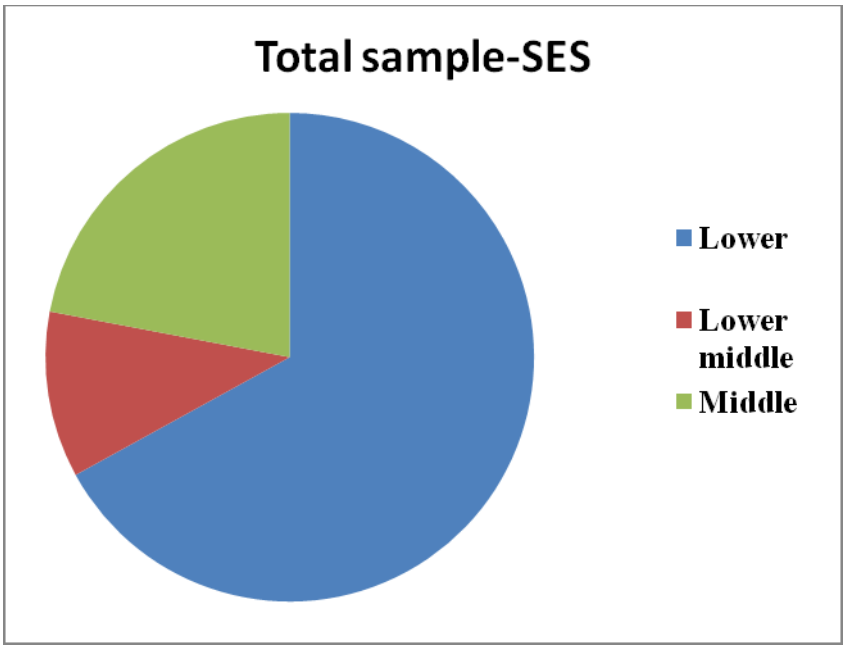

CHART 1

Chi-Square test to compare proportions of occupation between cases and controls (Table 7)

Occupation	Cases		Controls			
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
Unemployed	12	24.0	12	24.0	24	24.0
Unskilled	26	52.0	19	38.0	45	45.0
Skilled	9	18.0	10	20.0	19	19.0
Clerical	2	4.0	7	14.0	9	9.0
Professional	1	2.0	2	4.0	3	3.0
Total	50	100.0	50	100.0	100	100.0
P Value = 0.395						

Table 7 shows that on comparison of Employment status using Chi-square test there was no statistical significance between the groups.

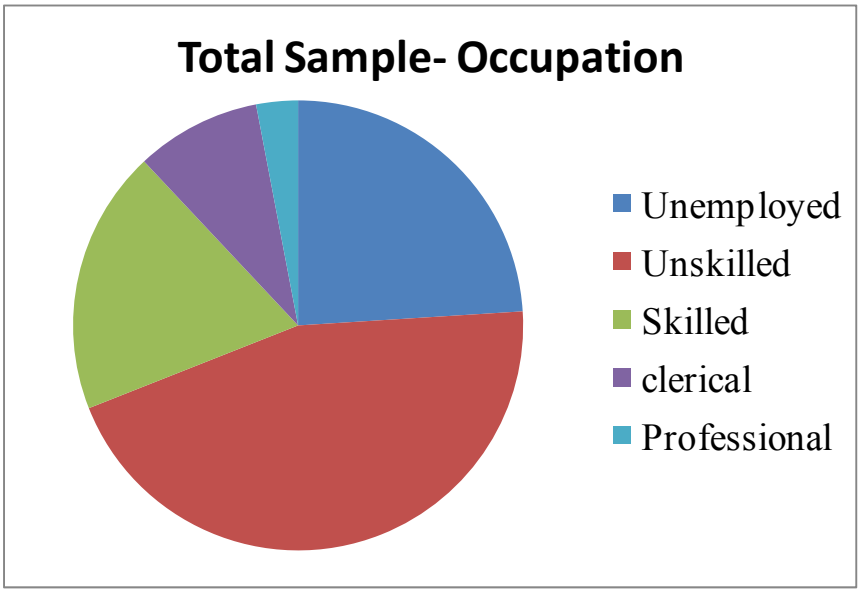

CHART 2

Chi-Square test to compare proportions of Marital status between cases and controls (Table 8)

Marital status	Cases		Controls			
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
Unmarried	15	30.0	11	22.0	26	26.0
Married & staying	24	48.0	27	54.0	51	51.0
Widow / Separated/ Divorce	11	22.0	12	24.0	23	23.0
Total	50	100.0	50	100.0	100	100.0
P Value : 0.111						

Table 8 shows that on comparison of marital status using Chi-square test there was no statistical significance between the groups.

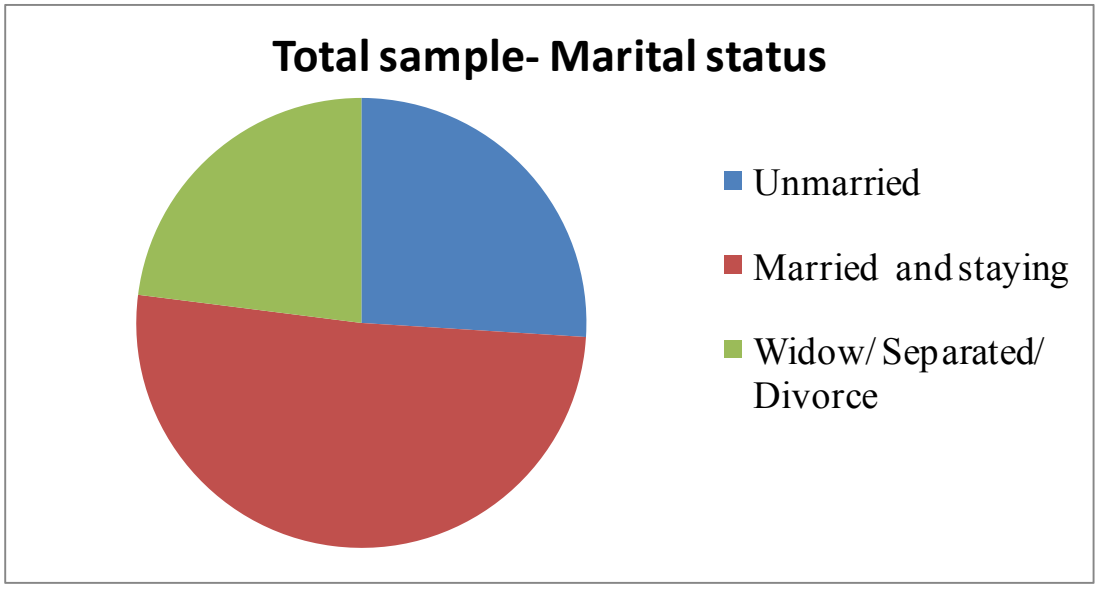

CHART 3

Chi-Square test to compare proportions of education in completed years between cases and controls (Table 9)

Education in completed years	Cases		Controls			
	BPD & AUD		BPD		Total	
	N	%	N	%	N	%
8	27	54.0	23	46.0	50	50.0
9	3	6.0	2	4.0	5	5.0
10	6	12.0	12	24.0	18	18.0
12	12	24.0	9	18.0	21	21.0
13	2	4.0	0	.0	2	2.0
15	0	.0	4	8.0	4	4.0
Total	50	100.0	50	100.0	100	100.0
P Value = 0.111						

Table 9 shows that on comparison of education in years using Chi-square test there was no statistical significance between the groups

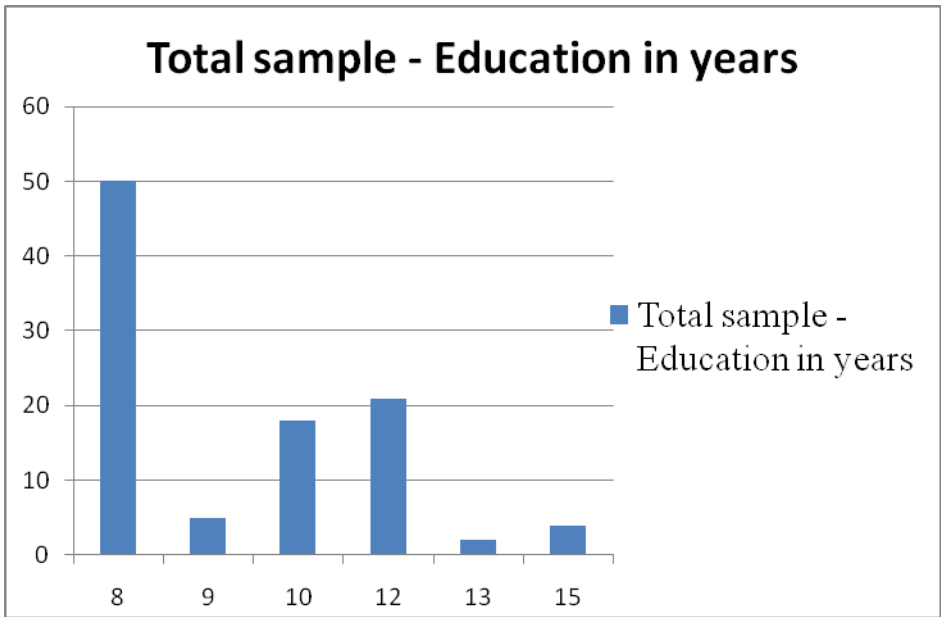

CHART 4

CASES Vs CONTROLS

Independent samples t-Test to compare mean values of bipolar illness variables between cases and controls (Table 10)

Variables	Cases/ controls	N	Mean	Std. Dev	t-Value	P-Value
Age of onset of illness in years	BPD & AUD	50	25.46	4.077	0.179	0.859
	BPD	50	25.28	5.842		
Duration of illness in years	BPD & AUD	50	11.92	7.943	1.735	0.086
	BPD	50	9.46	6.122		
No. of hospitalizations	BPD & AUD	50	2.70	1.581	2.562	**0.012**
	BPD	50	1.96	1.293		
Duration of longest episode in months	BPD & AUD	50	66.30	42.544	1.396	0.166
	BPD	50	52.60	54.802		

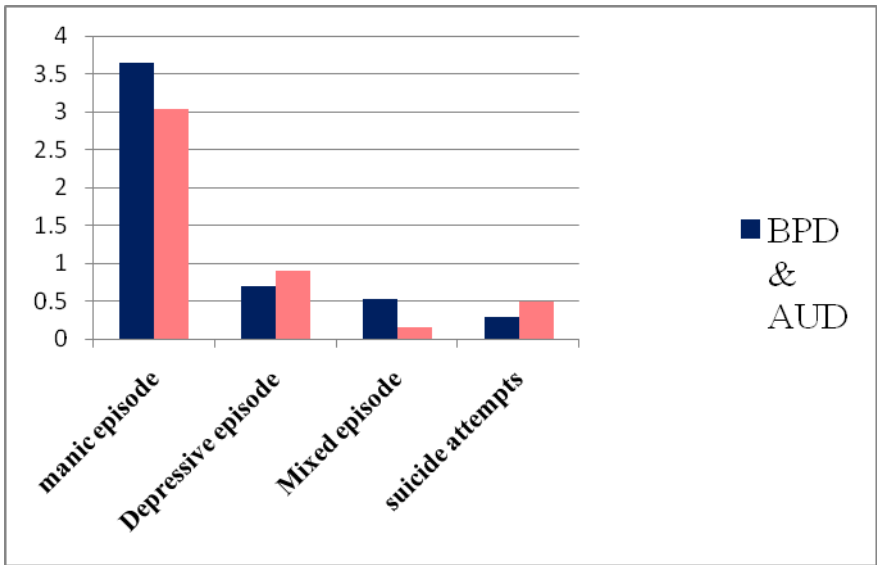

CHART 5

Independent samples t-Test to compare mean values of bipolar illness variables between cases and controls (Table 11)

Variables	Cases/ controls	N	Mean	Std. Dev	t-Value	P-Value
Total No. of episodes	BPD & AUD	50	4.82	2.488	1.493	0.139
	BPD	50	4.10	2.332		
No. of manic/ hypomanic episodes	BPD & AUD	50	3.64	1.804	1.722	0.088
	BPD	50	3.04	1.678		
No. of depressive episodes	BPD & AUD	50	0.70	0.707	1.247	0.264
	BPD	50	0.90	0.886		
No. of mixed episodes	BPD & AUD	50	0.52	0.707	3.003	**0.005**
	BPD	50	0.16	0.468		
No. of suicide attempts	BPD & AUD	50	0.50	0.707	1.852	0.095
	BPD	50	0.28	0.454		

Tables 10 &11 shows that bipolar patients with comorbid alcohol use disorder had significantly higher number of mixed episodes than bipolar disorder without alcohol use. The table also show the significant increase in no. of hospitalisations in cases group. In other clinical variables there was no significant difference between the two groups.

Independent samples t-Test to compare mean values of personality variables between cases and controls (Table 12)

Variables	Cases/ controls	N	Mean	Std. Dev	t-Value	P-Value
Neuroticism	BPD & AUD	50	34.06	6.529	10.234	**<0.001**
	BPD	50	22.68	4.382		
Extraversion	BPD & AUD	50	21.68	2.744	1.082	0.282
	BPD	50	22.26	2.617		
Openness to Experience	BPD & AUD	50	34.86	3.574	6.074	**<0.001**
	BPD	50	30.50	3.604		
Agreeableness	BPD & AUD	50	29.00	3.245	0.403	0.688
	BPD	50	29.26	3.200		
Conscientiousness	BPD & AUD	50	31.34	3.224	0.567	0.572
	BPD	50	31.72	3.476		

Tables 12 shows that bipolar patients with comorbid alcohol use disorder had significantly higher scores on personality traits of Neuroticism and Openness to Experience than bipolar disorder without alcohol use. When average scores were compared the controls had high scores on neuroticism and cases group had very high scores on neuroticism. Both groups had low scores on

extraversion. Controls had average scores on openness to experience whereas cases had high scores. In Agreeableness and Conscientiousness traits both groups had average scores.

Comparison of means personality trait scores of cases and controls

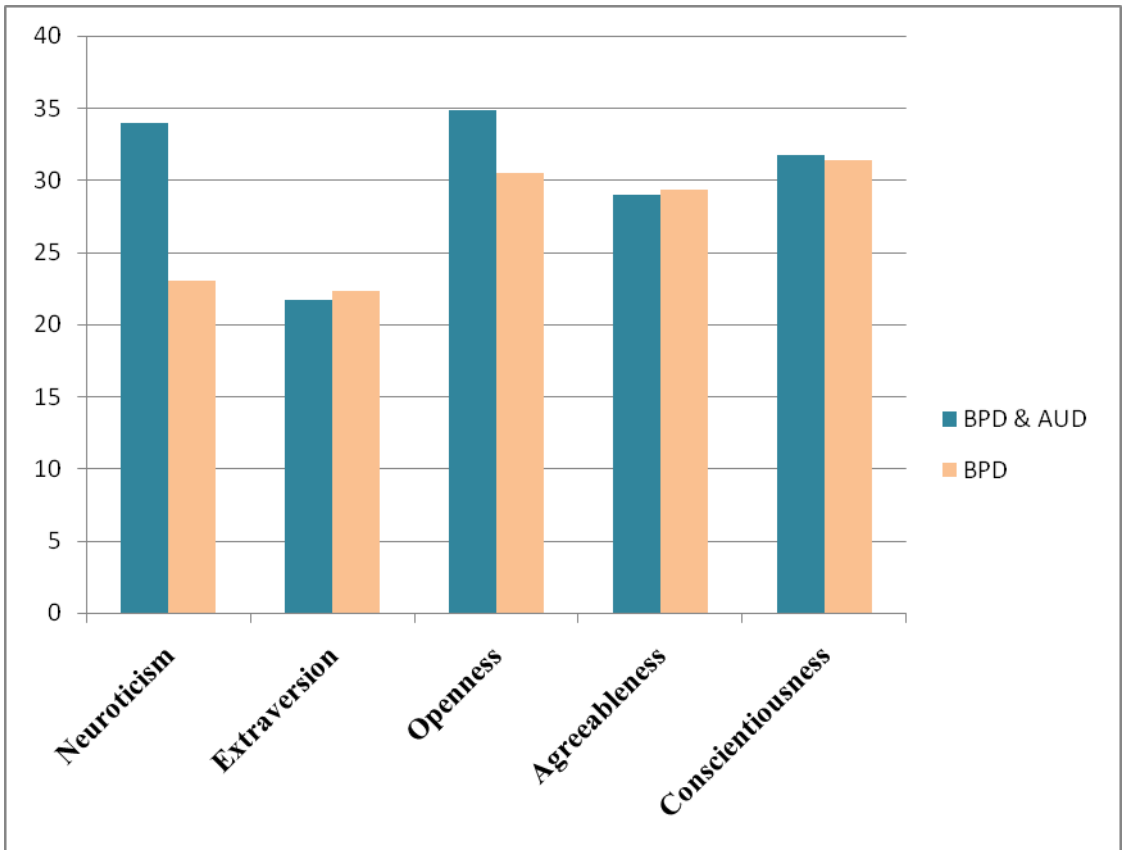

CHART 6

Cognitive variables

Chi-Square test to compare proportions of subsets of FAB battery between cases and controls

Table 13

FAB-Similarities	Cases/ controls						P-Value
	BPD & AUD		BPD		Total		
	N	%	N	%	N	%	
1	6	12.0	0	.0	6	6.0	**<0.001**
2	29	58.0	19	38.0	48	48.0	
3	15	30.0	31	62.0	46	46.0	
Total	50	100.0	50	100.0	100	100.0	

Table 14

FAB-Lexical fluency	Cases/ controls						P-Value
	BPD & AUD		BPD		Total		
	N	%	N	%	N	%	
1	13	26.0	4	8.0	17	17.0	**0.001**
2	36	72.0	36	72.0	72	72.0	
3	1	2.0	10	20.0	11	11.0	
Total	50	100.0	50	100.0	100	100.0	

Chi-Square test to compare proportions of subsets of FAB battery between cases and controls

Table 15

FAB-Motor luria	Cases/ controls						P-Value
	BPD & AUD		BPD		Total		
	N	%	N	%	N	%	
1	15	30.0	2	4.0	17	17.0	**<0.001**
2	26	52.0	27	54.0	53	53.0	
3	9	18.0	21	42.0	30	30.0	
Total	50	100.0	50	100.0	100	100.0	

Table 16

FAB-Conflicting instructions	Cases/ controls						P-Value
	BPD & AUD		BPD		Total		
	N	%	N	%	N	%	
1	18	36.0	10	20.0	28	28.0	0.031
2	29	58.0	32	64.0	61	61.0	
3	3	6.0	8	16.0	11	11.0	
Total	50	100.0	50	100.0	100	100.0	

Chi-Square test to compare proportions of subsets of FAB battery between cases and controls

Table 17

FAB-Go-no-go	Cases/ controls						P-Value
	BPD & AUD		BPD		Total		
	N	%	N	%	N	%	
0	9	18.0	0	.0	9	9.0	**<0.001**
1	24	48.0	10	20.0	34	34.0	
2	17	34.0	37	74.0	54	54.0	
3	0	.0	3	6.0	3	3.0	
Total	50	100.0	50	100.0	100	100.0	

Table 18

FAB-Prehension	Cases/ controls						P-Value
	BPD & AUD		BPD		Total		
	N	%	N	%	N	%	
2	26	52.0	14	28.0	40	40.0	0.015
3	24	48.0	36	72.0	60	60.0	
Total	50	100.0	50	100.0	100	100.0	

Comparison of means of FAB subsets scores between cases and controls.

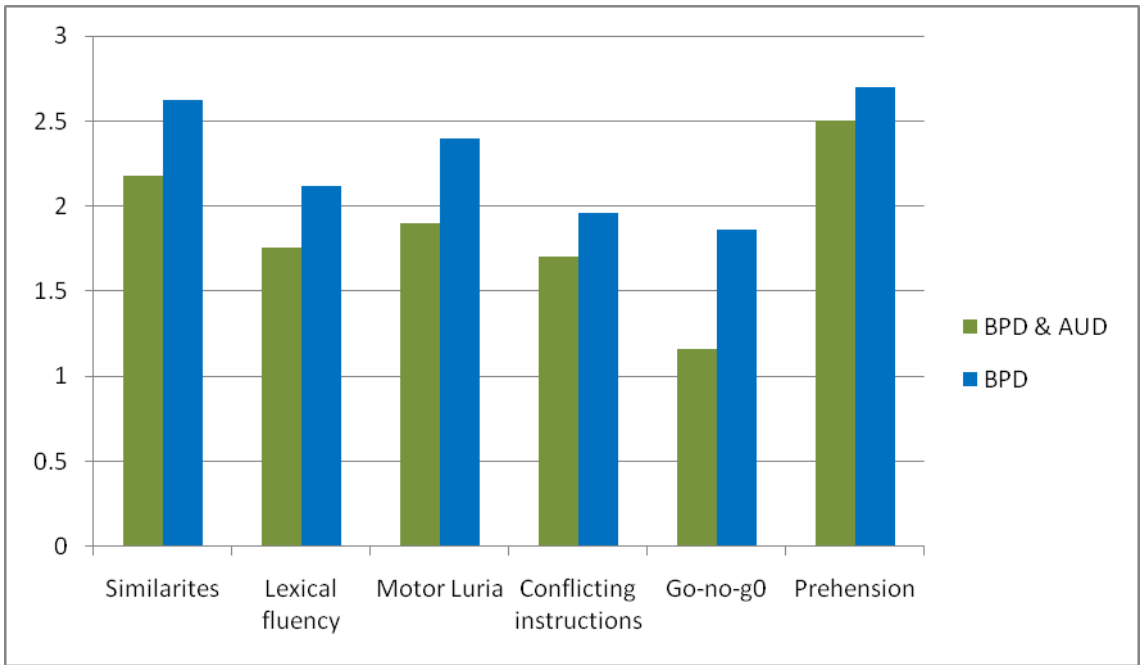

CHART 7

Tables 13-18 shows that bipolar patients with comorbid alcohol use disorder have significantly lower scores on similarities, lexical fluency, motor luria and go-no—go subsets of Frontal lobe Assessment battery than bipolar disorder without alcohol use.

Independent samples t-Test to compare mean values of cognitive variables between cases and controls (Table 19)

Variables	Cases/ controls	N	Mean	Std. Dev	t-Value	P-Value
FAB Total score	BPD & AUD	50	11.24	2.832	5.273	**<0.001**
	BPD	50	13.74	1.794		
Stroop effect in sec	BPD & AUD	50	285.96	42.618	13.198	**<0.001**
	BPD	50	198.10	19.985		
DSST in sec	BPD & AUD	50	354.96	39.348	11.290	**<0.001**
	BPD	50	281.16	24.255		
N 1 back-hit	BPD & AUD	50	8.14	.572	0.179	0.859
	BPD	50	8.16	.548		
N 2 back-hit	BPD & AUD	50	6.26	1.026	0.00	1.000
	BPD	50	6.26	1.026		
N 1 back-error	BPD & AUD	50	1.58	.883	0.223	0.824
	BPD	50	1.54	.908		
N 2 back-error	BPD & AUD	50	4.00	1.666	0.185	0.854
	BPD	50	3.94	1.583		

Comparison of Stroop effect and DSST scores between cases and controls

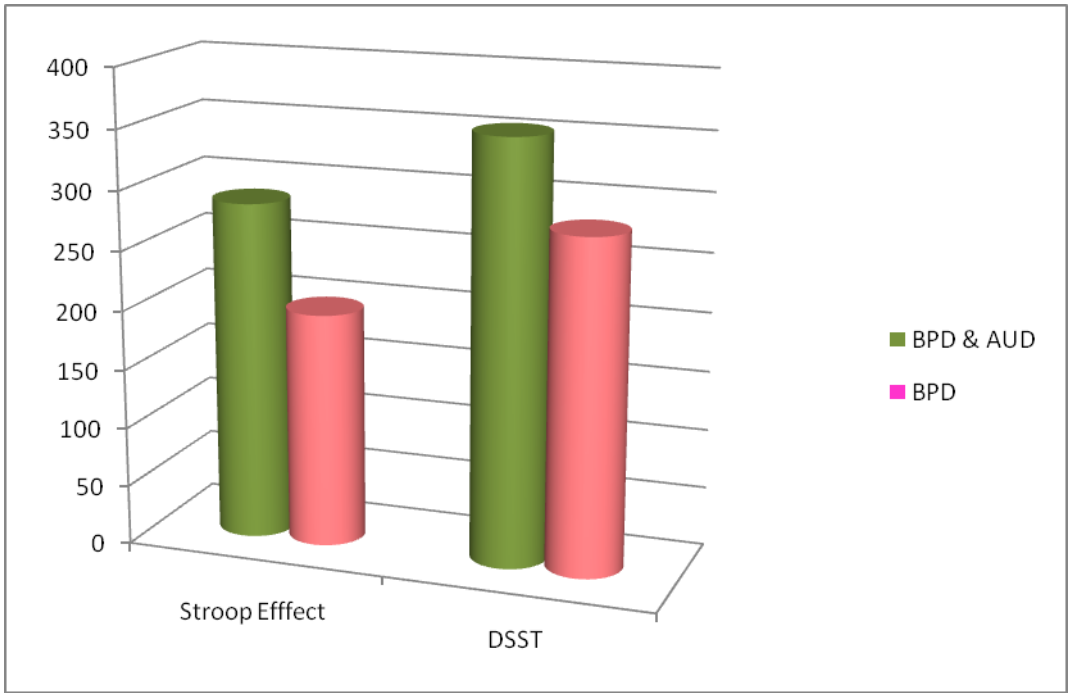

CHART 8

Tables 19 shows that bipolar patients with comorbid alcohol use disorder take significantly longer time to complete Digit symbol substitution test than bipolar disorder without alcohol use. The Stroop effect score and FAB score are significantly higher in Bipolar disorder with alcohol use group than only bipolar group. Both groups scored higher scores in Stroop test and DSST when compared to normative data. N back test scores were normal when compared to normative data in both the groups.

BIPOLAR DISORDER PATIENTS WITH ALCOHOL DEPENDENCE VS ALCOHOL ABUSE

Independent samples t-Test to compare mean values of bipolar illness variables between Alcohol dependence Vs abuse (Table20)

Variables	Current use-abuse/ dependence	N	Mean	Std. Dev	t-Value	P-Value
Age of onset of illness in years	Abuse	17	24.00	3.588	1.863	0.069
	Dependence	33	26.21	4.159		
Duration of illness in years	Abuse	17	9.47	8.163	1.589	0.119
	Dependence	33	13.18	7.646		
No. of hospitalizations	Abuse	17	2.18	1.131	1.713	0.093
	Dependence	33	2.97	1.723		
Duration of longest episode in months	Abuse	17	50.29	29.500	1.964	0.055
	Dependence	33	74.55	46.155		

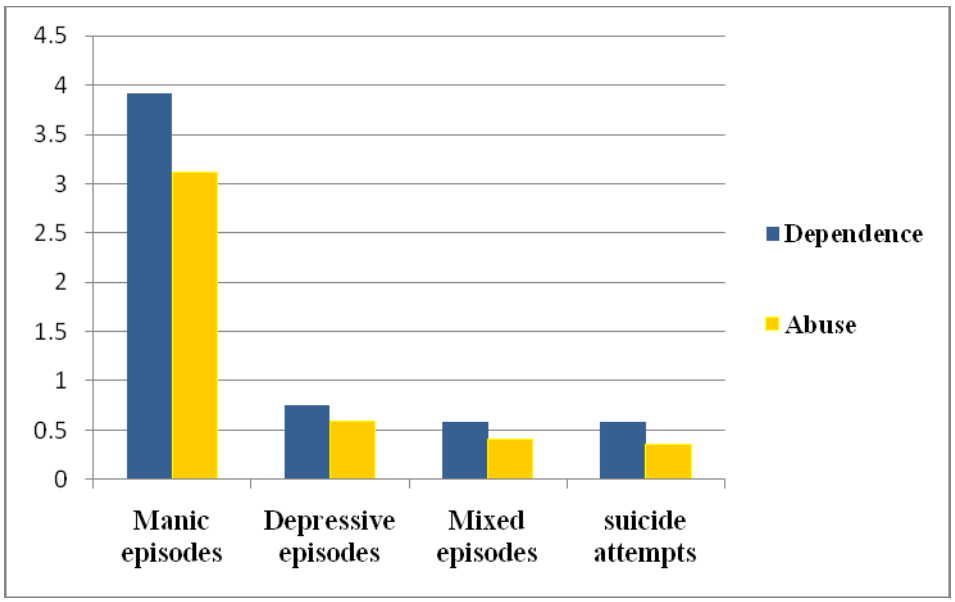

CHART 9

Independent samples t-Test to compare mean values of bipolar illness variables between Alcohol dependence Vs abuse (Table21)

Variables	Current use-abuse/ dependence	N	Mean	Std. Dev	t-Value	P-Value
Total No. of episodes	Abuse	17	3.88	2.233	1.968	0.055
	Dependence	33	5.30	2.506		
No. of manic/ hypomanic episodes	Abuse	17	3.12	1.691	1.487	0.143
	Dependence	33	3.91	1.826		
No. of depressive episodes	Abuse	17	0.59	0.712	0.799	0.529
	Dependence	33	0.76	0.708		
No. of Mixed episodes	Abuse	17	0.41	0.712	0.774	0.531
	Dependence	33	0.58	0.708		
No. of suicide attempts	Abuse		0.35	0.702	1.057	0,401
	Dependence		0.58	0.708		

Tables 20 & 21does not show any significant difference in the bipolar clinical variables in the bipolar patients between alcohol dependence and alcohol abuse groups.

Independent samples t-Test to compare mean values between Alcohol dependence Vs Abuse (Table 22)

Variables	Current use-abuse/ dependence	N	Mean	Std. Dev	t-Value	P-Value
Neuroticism	Abuse	17	28.53	2.065	7.038	**<0.001**
	Dependence	33	36.91	6.207		
Extraversion	Abuse	17	21.76	2.538	0.155	0.877
	Dependence	33	21.64	2.881		
Openness to experience	Abuse	17	34.00	3.536	1.227	0.226
	Dependence	33	35.30	3.566		
Agreeableness	Abuse	17	29.06	3.783	0.091	0.928
	Dependence	33	28.97	2.995		
Conscientiousness	Abuse	17	30.65	3.141	1.093	0.280
	Dependence	33	31.70	3.255		

Tables 22 show that bipolar patients with alcohol dependence had significantly higher scores on personality trait of Neuroticism than alcohol abuse. When average scores were compared the abuse group had high scores on neuroticism and dependence group had very high scores on neuroticism. Both groups had low scores on extraversion and high scores on openness to experience. In Agreeableness and Conscientiousness traits both groups had average scores.

Comparison of means personality trait scores of bipolar disorder with alcohol dependence Vs abuse

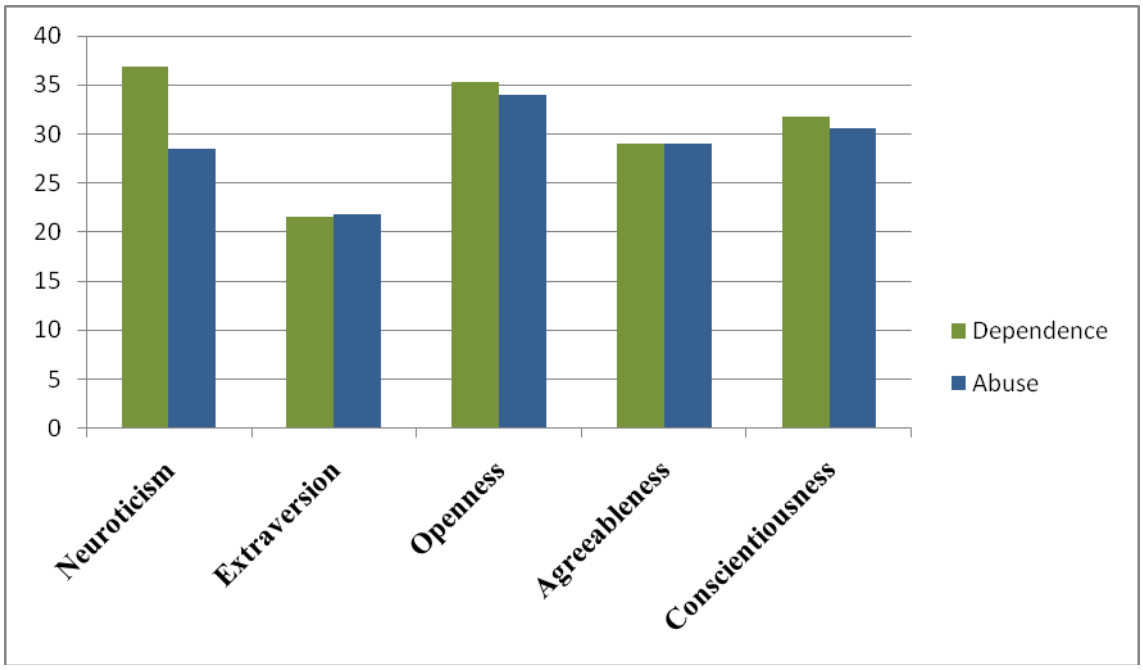

CHART 10

Chi-Square test to compare proportions of FAB scores between Bipolar disorder with alcohol dependence Vs abuse

Table 23

FAB-Similarities	Current use-abuse/ dependence						P-Value
	Dependence		Abuse		Total		
	N	%	N	%	N	%	
1	6	18.2	0	.0	6	12.0	**0.001**
2	22	66.7	7	41.2	29	58.0	
3	5	15.2	10	58.8	15	30.0	
Total	33	100.0	17	100.0	50	100.0	

Table 24

FAB-Lexical fluency	Current use-abuse/ dependence						P-Value
	Dependence		Abuse		Total		
	N	%	N	%	N	%	
1	13	39.4	0	.0	13	26.0	0.011
2	19	57.6	17	100.0	36	72.0	
3	1	3.0	0	.0	1	2.0	
Total	33	100.0	17	100.0	50	100.0	

Chi-Square test to compare proportions of FAB scores between Bipolar disorder with alcohol dependence Vs abuse

Table 25

FAB-Motor luria	Current use-abuse/ dependence						P-Value
	Dependence		Abuse		Total		
	N	%	N	%	N	%	
1	15	45.5	0	.0	15	30.0	**<0.001**
2	16	48.5	10	58.8	26	52.0	
3	2	6.1	7	41.2	9	18.0	
Total	33	100.0	17	100.0	50	100.0	

Table 26

FAB-Conflicting instructions	Current use-abuse/ dependence						P-Value
	Dependence		Abuse		Total		
	N	%	N	%	N	%	
1	18	54.5	0	.0	18	36.0	**<0.001**
2	15	45.5	14	82.4	29	58.0	
3	0	.0	3	17.6	3	6.0	
Total	33	100.0	17	100.0	50	100.0	

Chi-Square test to compare proportions of FAB scores between Bipolar disorder with alcohol dependence Vs abuse

Table 27

FAB- Go-no-go	Current use-abuse/ dependence						P-Value
	Dependence		Abuse		Total		
	N	%	N	%	N	%	
0	9	27.3	0	.0	9	18.0	**<0.001**
1	20	60.6	4	23.5	24	48.0	
2	4	12.1	13	76.5	17	34.0	
3	0	.0	0	.0	0	.0	
Total	33	100.0	17	100.0	50	100.0	

Table 28

FAB- Prehension	Current use-abuse/ dependence						P-Value
	Dependence		Abuse		Total		
	N	%	N	%	N	%	
2	22	66.7	4	23.5	26	52.0	**0.004**
3	11	33.3	13	76.5	24	48.0	
Total	33	100.0	17	100.0	50	100.0	

Tables 23-28 shows that bipolar patients with alcohol dependence had significantly lower scores on similarities, motor luria, conflicting instructions, go-no-go and prehension subsets of Frontal lobe Assessment battery than alcohol abuse group.

Comparison of means of subsets of Frontal lobe assessment battery in bipolar disorder with alcohol dependence Vs abuse

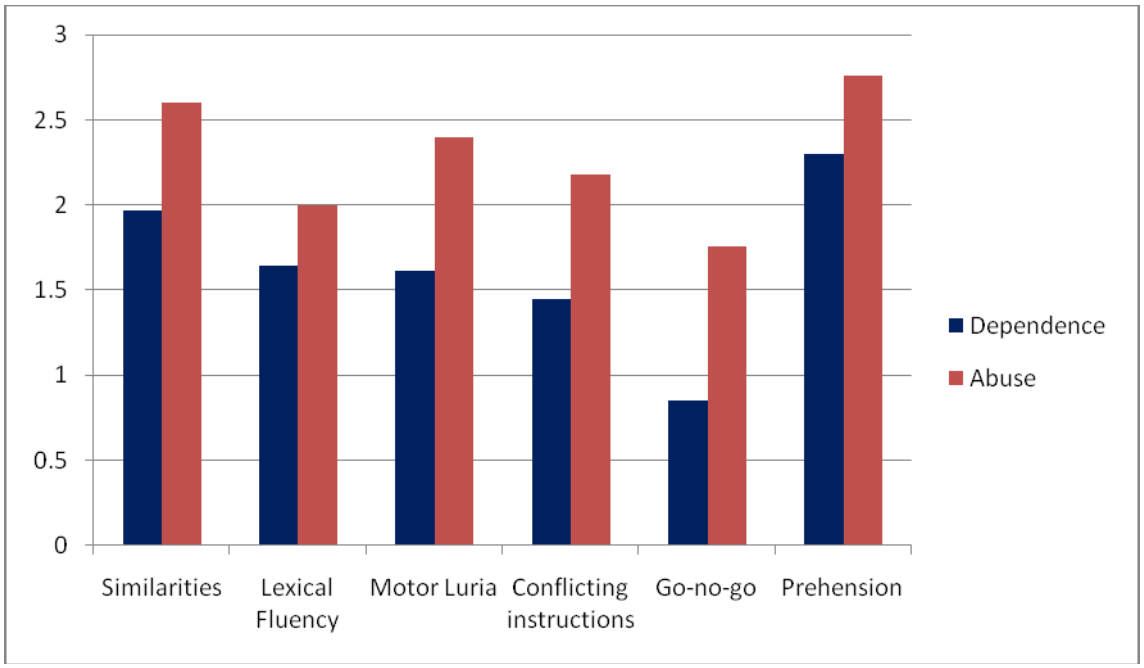

CHART 11

Independent samples t-Test to compare mean values of cognitive tests between Bipolar disorder with Alcohol dependence Vs Abuse

Table 29

Variables	Current use-abuse/ dependence	N	Mean	Std. Dev	t-Value	P-Value
FAB Total score	Abuse	17	13.94	1.478	7.604	**<0.001**
	Dependence	33	9.85	2.307		
Stroop effect in sec	Abuse	17	244.18	21.451	7.002	**<0.001**
	Dependence	33	307.48	33.850		
DSST in sec	Abuse	17	314.59	17.734	7.712	**<0.001**
	Dependence	33	375.76	30.026		
N 1 back- hit	Abuse	17	8.71	.470	6.577	**<0.001**
	Dependence	33	7.85	.364		
N 2 back-hit	Abuse	17	7.18	.809	5.885	**<0.001**
	Dependence	33	5.79	.781		
N 1 back- error	Abuse	17	.65	.606	8.263	**<0.001**
	Dependence	33	2.06	.556		
N 2 back-error	Abuse	17	2.24	1.393	7.208	**<0.001**
	Dependence	33	4.91	.879		

Comparison of Stroop effect and DSST scores between bipolar disorder with alcohol dependence Vs abuse

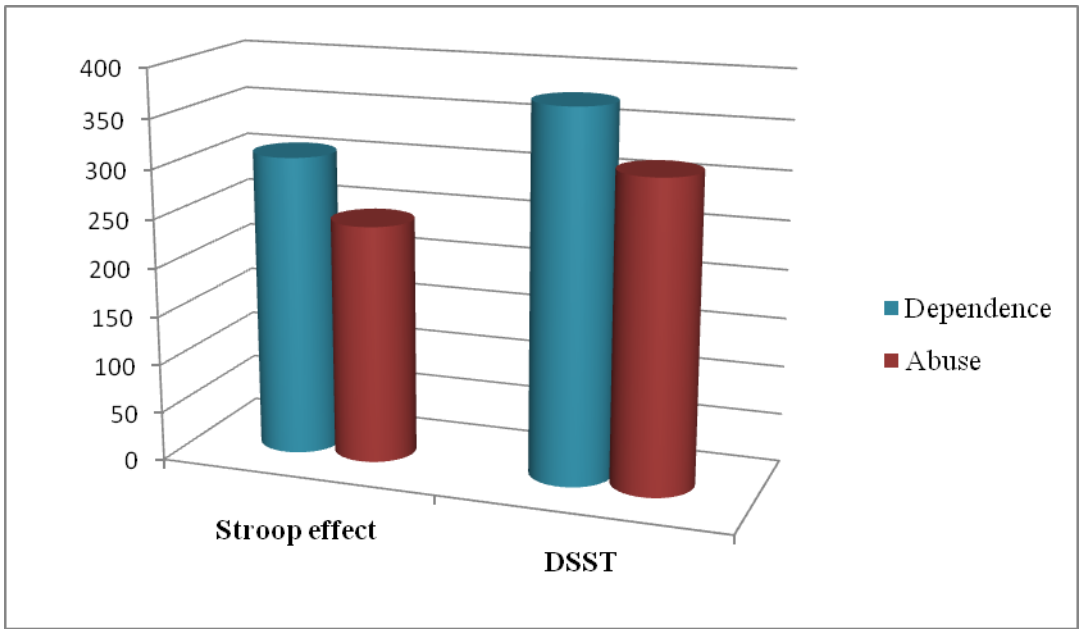

CHART 12

Tables 29 shows that bipolar patients with alcohol dependence took significantly longer time to complete Digit symbol substitution test than bipolar disorder with alcohol abuse. The Stroop effect score and FAB score were significantly higher in dependence group than abuse group. Both groups took longer time to complete Stroop test and DSST when compared to normative data. N back test scores were normal but showed significant difference between both groups.

CORRELATION OF ALCOHOL INTAKE RELATED VARIABLES VS DEMOGRAPHIC VARIABLES, BIPOLAR ILLNESS VARIABLES, PERSONALITY VARIABLES, COGNITIVE TEST VARIABLES

Alcohol intake related variables Vs Socio-demographic variables

One way ANOVA to compare the mean values between SES groups (Table 30)

Variables	SES	N	Mean	Std. Dev	P-Value
Age of onset of alcohol use in years	Lower	32	22.59	4.536	0.516
	Lower middle	9	21.89	3.551	
	Middle	9	20.56	6.126	
	Total	50	22.10	4.670	
Duration of alcohol use in years	Lower	32	15.22	6.969	0.052
	Lower middle	9	10.00	7.467	
	Middle	9	18.11	6.373	
	Total	50	14.80	7.267	
Audit scores	Lower	32	18.97	8.589	0.245
	Lower middle	9	14.11	6.735	
	Middle	9	18.11	2.315	
	Total	50	17.94	7.638	
SAD Q scores	Lower	32	33.69	17.062	0.173
	Lower middle	9	23.00	12.319	
	Middle	9	31.11	3.887	
	Total	50	31.30	15.093	

One way ANOVA to compare the mean values between SES groups

ANOVA table (Table 31)

Variables	Sum of Squares		df	Mean Square	F-Value	P-Value
Age of onset of alcohol use in years	Between Groups	29.670	2	14.835	0.671	0.516
	Within Groups	1038.830	47	22.103		
	Total	1068.500	49			
Duration of alcohol use in years	Between Groups	311.642	2	155.821	3.247	0.052
	Within Groups	2276.358	47	48.433		
	Total	2588.000	49			
Audit scores	Between Groups	166.073	2	83.037	1.449	0.245
	Within Groups	2692.747	47	57.292		
	Total	2858.820	49			
SAD Q scores	Between Groups	802.736	2	401.368	1.821	0.173
	Within Groups	10359.764	47	220.421		
	Total	11162.500	49			

Tables 30 & 31 shows that one way ANOVA analysis did not find any association between the alcohol intake variables and Socio-economic status.

One way ANOVA to compare the mean values between Marital status- Descriptive status(Table 32)

Variable	Marital status	N	Mean	Std. Dev	P-Value
Age of onset of alcohol use in years	Unmarried	15	21.20	3.121	0.014
	Married & staying	24	21.04	4.144	
	Separated	11	25.64	6.005	
	Total	50	22.10	4.670	
Duration of alcohol use in years	Unmarried	15	8.27	5.120	<0.001
	Married & staying	24	18.88	4.767	
	Wid / Sep/ Div	11	14.82	8.122	
	Total	50	14.80	7.267	
Audit scores	Unmarried	15	17.20	8.562	0.656
	Married & staying	24	17.54	7.163	
	Wid / Sep/ Div	11	19.82	7.757	
	Total	50	17.94	7.638	
SAD Q scores	Unmarried	15	28.33	15.900	0.255
	Married & staying	24	30.17	14.233	
	Wid / Sep/ Div	11	37.82	15.276	
	Total	50	31.30	15.093	

One way ANOVA to compare the mean values between Marital status -ANOVA Tables (Table 33)

Variables	Sum of Squares		df	Mean Square	F-Value	P-Value
Age of onset of alcohol use in years	Between Groups	176.596	2	88.298	4.653	0.014
	Within Groups	891.904	47	18.977		
	Total	1068.500	49			
Duration of alcohol use in years	Between Groups	1038.805	2	519.403	15.758	**<0.001**
	Within Groups	1549.195	47	32.962		
	Total	2588.000	49			
Audit scores	Between Groups	50.825	2	25.413	.425	0.656
	Within Groups	2807.995	47	59.745		
	Total	2858.820	49			
SAD Q scores	Between Groups	630.197	2	315.098	1.406	0.255
	Within Groups	10532.303	47	224.092		
	Total	11162.500	49			

Tables 32 & 33 shows that one way ANOVA analysis found significant association between duration of alcohol use and marital status.

One way ANOVA to compare the mean values between Occupations

Descriptive statistics (Table 34)

Variables	Occupation	N	Mean	Std. Dev	P-Value
Age of onset of alcohol use in years	Unemployed	12	24.83	5.184	**0.004**
	Unskilled	26	21.92	3.554	
	Skilled	9	19.11	4.285	
	Clerical	2	17.00	2.828	
	Professional	1	31.00	.	
	Total	50	22.10	4.670	
Duration of alcohol use in years	Unemployed	12	17.83	6.952	0.205
	Unskilled	26	13.00	7.833	
	Skilled	9	14.78	5.019	
	Clerical	2	22.00	2.828	
	Professional	1	11.00	.	
	Total	50	14.80	7.267	
Audit scores	Unemployed	12	18.92	7.856	0.984
	Unskilled	26	17.65	8.786	
	Skilled	9	17.67	5.315	
	Clerical	2	18.50	.707	
	Professional	1	15.00	.	
	Total	50	17.94	7.638	
SAD Q scores	Unemployed	12	34.92	17.154	0.919
	Unskilled	26	30.31	16.436	
	Skilled	9	30.00	10.770	
	Clerical	2	31.00	4.243	
	Professional	1	26.00	.	
	Total	50	31.30	15.093	

One way ANOVA to compare the mean values between Occupations

ANOVA Tables (Table 35)

Variables	Sum of Squares		df	Mean Square	F-Value	P-Value
Age of onset of alcohol use in years	Between Groups	302.098	4	75.525	4.434	**0.004**
	Within Groups	766.402	45	17.031		
	Total	1068.500	49			
Duration of alcohol use in years	Between Groups	312.778	4	78.194	1.547	0.205
	Within Groups	2275.222	45	50.560		
	Total	2588.000	49			
Audit scores	Between Groups	23.519	4	5.880	0.093	0.984
	Within Groups	2835.301	45	63.007		
	Total	2858.820	49			
SAD Q scores	Between Groups	226.045	4	56.511	0.233	0.919
	Within Groups	10936.455	45	243.032		
	Total	11162.500	49			

Tables 32 & 33 shows that one way ANOVA analysis found significant association between age onset of alcohol use and Occupation.

Correlation between education and alcohol related variables and Education

Table 36

Alcohol related variables		Education in completed years
Age of onset of alcohol use in years	Pearson Correlation	-0.157
	P-Value	0.277
	N	50
Duration of alcohol use in years	Pearson Correlation	0.164
	P-Value	0.254
	N	50
Audit scores	Pearson Correlation	-0.093
	P-Value	0.519
	N	50
SAD Q scores	Pearson Correlation	-0.102
	P-Value	0.482
	N	50

Table 36 shows that Bivariate analysis did not find any association between the alcohol intake variables and education

Correlation between Clinical variables and alcohol related variables (Table 37)

		Age of onset of alcohol use	duration of alcohol use	AUDIT scores	SAD-Q scores
Age of onset of illness	Pearson Correlation	.029	.043	.267	.253
	P value	.844	.766	.061	.076
	N	50	50	50	50
Duration of illness in years	Pearson Correlation	.294*	.756**	.174	.237
	P value	.038	**.000**	.226	.097
	N	50	50	50	50
No. of hospitalizations	Pearson Correlation	-.040	.403**	.125	.119
	P value	.782	**.004**	.386	.409
	N	50	50	50	50
No. of suicide attempts	Pearson Correlation	-.331*	.310*	.043	.089
	P value	.019	.029	.764	.539
	N	50	50	50	50

Table 37 shows that Bivariate analysis found significant association between duration of alcohol use and duration of bipolar illness & Number of hospitalisations due to illness

Correlation between Clinical variables and alcohol related variables

Table 38

		Age of onset of alcohol use	duration of alcohol use	AUDIT scores	SAD-Q scores
No. of episodes	Pearson Correlation	.040	.689**	.156	.220
	P Value	.782	**.000**	.279	.125
	N	50	50	50	50
No. of manic episodes	Pearson Correlation	.198	.608**	.170	.206
	P Value	.168	**.000**	.237	.152
	N	50	50	50	50
No. of depressive episodes	Pearson Correlation	-.189	.330*	-.105	-.012
	P Value	.190	**.019**	.466	.932
	N	50	50	50	50
No. of mixed episodes	Pearson Correlation	-.096	.350*	-.009	.046
	P Value	.505	**.013**	.949	.750
	N	50	50	50	50

Table 38 shows that Bivariate analysis found significant association between duration of alcohol use and No. of manic, mixed, depressive episodes & total episodes.

Correlations between Personality traits and Alcohol use variables (Table 39)

		Age of onset of alcohol use	Duration of alcohol use	Audit scores	SAD Q scores
Neuroticism	Pearson Correlation	.157	.300	.691	.691**
	P-Value	.276	**.034**	**.000**	**.000**
	N	50	50	50	50
Extraversion	Pearson Correlation	-.114	.254	-.054	-.025
	P-Value	.432	.076	.707	.865
	N	50	50	50	50
Openness to experience	Pearson Correlation	.201	-.177	.225	.249
	P-Value	.161	.219	.115	.081
	N	50	50	50	50
Agreeableness	Pearson Correlation	.213	-.073	-.079	.035
	P-Value	.138	.616	.585	.812
	N	50	50	50	50
Conscientiousness	Pearson Correlation	.144	-.075	.188	.289*
	P-Value	.318	.607	.191	**.042**
	N	50	50	50	50

Table 39 shows that Bivariate analysis found significant association between SADQ scores and personality traits of Neuroticism & Conscientiousness.

Correlation of scores of FAB subsets and Alcohol use related variables (Table 40)

		Age of onset of alcohol use	duration of alcohol use	AUDIT scores	SAD-Q scores
similarities	Pearson Correlation	-.124	-.523**	-.491**	-.543**
	P Value	.389	**.000**	**.000**	**.000**
	N	50	50	50	50
Lexical fluency	Pearson Correlation	-.026	-.509**	-.385**	-.433**
	P Value	.859	**.000**	**.006**	**.002**
	N	50	50	50	50
Motorluria	Pearson Correlation	-.015	-.335*	-.583**	-.640**
	P Value	.916	.017	**.000**	**.000**
	N	50	50	50	50
conflicting instructions	Pearson Correlation	-.041	-.542**	-.506**	-.558**
	P Value	.775	**.000**	**.000**	**.000**
	N	50	50	50	50
go-no-go	Pearson Correlation	-.159	-.417**	-.547**	-.600**
	P Value	.271	**.003**	**.000**	**.000**
	N	50	50	50	50
Prehension	Pearson Correlation	-.298*	-.252	-.469**	-.510**
	P Value	.036	.078	**.001**	**.000**
	N	50	50	50	50

Table 40 shows that Bivariate analysis found significant association between duration of alcohol use and FAB subsets of similarities, lexical fluency, conflicting instructions & go-no-go. The analysis also found association between AUDIT & SADQ scores and all six subsets of FAB.

Correlation of scores of Cognitive tests and Alcohol use related variables (Table 41)

		Age of onset of alcohol use	duration of alcohol use	AUDIT scores	SAD-Q scores
FAB total score	Pearson Correlation	-.119	-.527**	-.666**	-.738**
	P Value	.410	**.000**	**.000**	**.000**
	N	50	50	50	50
Sroop effect	Pearson Correlation	-.003	.494**	.561**	.638**
	P Value	.981	**.000**	**.000**	**.000**
	N	50	50	50	50
DSST	Pearson Correlation	-.023	.463**	.520**	.585**
	P Value	.872	**.001**	**.000**	**.000**
	N	50	50	50	50

Table 41 shows that Bivariate analysis found significant association between duration of alcohol use and scores of FAB, Stroop effect & Digit symbol substitution test. The Analysis also found significance association between AUDIT & SADQ scores and scores of FAB, Stroop effect & Digit symbol substitution test.

DISCUSSION

The aim of the current study was to assess the clinical characteristics, personality traits and neurocognitive functions in Bipolar disorder with comorbid alcohol use disorders and to compare them with bipolar disorder controls that matched with age, religion, language and domicile.

The sample consisted of fifty cases each of bipolar disorder with alcohol use disorders (cases) and bipolar disorder without alcohol use (controls) as per ICD-10 criteria. To minimise confounding factors they were matched for age. 8 and more years of education was chosen as inclusion factor to enable the subjects to perform cognitive tests. Since all 50 of cases were males, males were chosen as controls. It was made sure that patient was not sedated on the day of assessment. Assessment sessions did not exceed more than one hour at a stretch. The Assessments were done on 1-2 sessions.

Both groups did not differ in the language they speak, religion they follow and place where they reside.

Findings in Socio-demographic data

In our study, bipolar patients with alcohol use disorders were predominantly married and there was no significant difference in the marital status when compared with the control group. Michael F Grunebaum et al., demonstrated similar results in his study on bipolar disorder with comorbid substance use[96]. But in another study, Kumar PN et al., found that bipolar patients with substance use were predominantly unmarried[93].

In our study we found that alcohol use disorder was not associated with unemployment or low economic status in bipolar patients. But Kumar PN et al., in his study found that bipolar patients with substance use were predominantly unemployed[93].

Findings in clinical characteristics of illness

In our study, there was significant increase in the psychiatric hospitalization in the cases group. Similarly Cassidy F et al., found that bipolar patients with life time use of alcohol had increased hospitalizations[26]. Sonne SC et al., also found higher incidence of

hospitalizations in bipolar patients with substance abuse[9]. But Gruenbaum et al., did not find any difference in the no. of hospitalizations between bipolar patients with and without substance use[96]. Boaz Levy et al., also demonstrated no significant difference in the number of hospitalizations in both the groups[83].

In our study we did not find statistical difference in age of onset of bipolar illness with substance abuse and controls. Our finding was similar to the study done by Boaz Levy et al., who found no statistical difference in age of onset of bipolar illness in both the groups[83]. But Sonne SC et al., in her study found early onset of mood problems in bipolar disorder when there was comorbid substance use[9]. Similar findings were demonstrated by Kumar PN et al., in a sample of 100 patients[93]. David F Marshall et al., also demonstrated early age of onset of illness in bipolar patients with substance use disorders[99].

In our study, the duration of episode was not affected by alcohol use in bipolar patients. Our findings were similar to Gruenbaum et al., who also did not find any difference between bipolar patients with and without substance use on the duration of episode[96]. But Goldberg JF et al., in his study demonstrated remission in bipolar patients with history of

substance use was less likely and they had poor outcome[94]. Strakowski et al., also found poor long term recovery in bipolar patients with substance use[23].

In our study we found significant higher incidence of mixed episodes in bipolar disorder with substance abuse. There was no significant difference in the number of manic and depressive episodes in bipolar patient with and without alcohol use. This was similar to the findings by Sonne SC et al[9]. Kumar PN et al., also demonstrated that substance abusers in bipolar disorder had more dysphoric mood states[93]. Gruenbaum et al., did not find any difference between bipolar patients with and without substance use in the numbers of depressive episodes and manic episodes[96]. But David F Marshall et al., demonstrated increased number of manic episodes in bipolar patients with substance use disorders[99].

In our study we did not find a significant difference in the history of number of suicide attempts between cases and controls. Alcohol use disorders were not associated with increase in number of suicide attempts in bipolar disorder. The findings were similar to previous study done by Etain B et al., who found no association between impulsiveness and

alcohol use in bipolar disorder[13]. But Grunebaum et al., demonstrated more frequent suicide attempts in bipolar disorder with comorbid substance use[96].

Findings related to personality traits

In our study bipolar disorder patients had high neuroticism scores in both the groups. But in alcohol use disorder group the scores were significantly very high as compared to non alcoholic group. The bipolar patients with alcohol use disorders scored significantly high on openness to experience. There was no significant difference in the other traits of personality. Consistent with previous study of James A. Harley et al, both the groups showed high scores on neuroticism[46]. Our findings were similar to study by Haro G et al who demonstrated that novelty seeking behaviour was significantly higher in bipolar patients with substance abuse[52]. Tijssen et al, also found that onset of manic symptom was associated with substance use and novelty seeking[45]. There are very limited comparative studies to analyse the personality trait predisposing to substance abuse in bipolar disorder.

Findings related to cognitive functions

In our study both groups did not differ significantly in the scores of Verbal N1 back and N2 back tests. The scores of both group in hits and errors of verbal N back test which tested the working memory was comparable to the normative data. There was no group difference on measures of working memory. Our finding was similar to the study done by Boaz Levy et al., who in a sample of 51 bipolar patients with and without alcohol use disorders did not find any group differences in working memory[83].

In our study we found that bipolar with alcohol use disorders when compared to non-alcohol group had poorer performance in the Frontal lobe assessment battery subsets of similarities, lexical fluency, Motor luria and go-no-go which tested the executive functions of conceptualization, mental flexibility, programming and inhibitory control respectively. Bipolar disorder with alcohol use disorders when compared to non-alcohol group scored significantly low on total FAB scores. The findings were similar to the study done by Boaz Levy et al, who demonstrated poorer performance in the bipolar patients with alcohol use on phonemic fluency and cognitive flexiblity[83]. Van Gorp et al. and

Robinson et al., also demonstrated poor performance on the executive functions particularly interference[65]. Levy et al also demonstrated severe impairment in executive functions in bipolar disorder with alcohol dependence regardless of being Euthymic[83]. Similar findings were demonstrated by David F Marshall et al., who showed poorer performance of conceptualization in bipolar disorder with alcohol use[99]. Sachen-Moreno J et al., demonstrated poorer performance in executive functions in both the groups[100].

In our study, time taken to complete stroop test which tested the inhibitory control, was prolonged in both the groups when compared to normative data. But bipolar disorder with alcohol use group when compared to non-alcohol group took significantly longer time and scores on Stroop effect was higher. The findings were similar to the study done by Boaz Levy et al, who demonstrated poorer performance in the bipolar patients with alcohol use on Stroop test[83]. Sachen-Moreno J et al., also demonstrated poorer performance in stroop test in bipolar disorder with substance use[100].

In our study, the time taken to complete digit symbol substitution test which tested the visual motor coordination, motor persistence and

most importantly response speed was prolonged when compared to normative data. But bipolar disorder with alcohol use when compared to non-alcohol group had significantly higher scores on digit symbol substitution test. In his study, De Oliveira LG et al., demonstrated poor performance on Digit symbol substitution test in cocaine users.

Findings within bipolar with alcohol use disorder (cases) group

In the comparative analysis done within the cases between bipolar disorder with alcohol dependence and alcohol abuse groups there was no significant difference in the socio-demographic data between the two groups.

In our study, there was no significant difference between the dependence and abuse groups in the clinical variables –age of onset of bipolar illness, duration of illness, No. of hospitalizations, number and type of episodes and suicide attempts.

In the analysis of personality traits in bipolar disorder between dependence and abuse groups significant difference was present in the trait of neuroticism. Though both the groups scored higher on neuroticism

trait, the scores of dependence group were very high compared to abuse group. Both groups scored low on extraversion, average on agreeableness and conscientiousness. There was no statistical difference between the scores of these traits between both groups.

In our study we found that in bipolar disorder when alcohol dependence was compared to alcohol abuse, subjects with dependence had poorer performance in the subsets of similarities, Motor luria, conflicting instructions, go-no-go and prehension behaviour of Frontal lobe assessment battery which tested the executive functions of conceptualization, programming, sensitivity to interference, inhibitory control and environmental autonomy respectively. Dependence group when compared to abuse group scored significantly low on total FAB scores. The dependence group scored an average of 9.85 which is above the normative value of 12 as against the abuse group average of 13.94.

In our study, the time taken to complete stroop test when compared to normative data was prolonged in both the groups. But bipolar disorder with alcohol dependence when compared to abuse took significantly longer time and scores on stroop effect was higher.

In our study, the time taken to complete the digit symbol substitution test which tested the visual motor coordination, motor persistence and most importantly response speed was prolonged in both groups. But bipolar disorder with alcohol dependence when compared to abuse group had significantly higher scores on digit symbol substitution test.

The scores of both group in hits and errors of verbal N back test which tested the working memory was comparable to the normative data. There was no deficit in working memory of both the groups. But In our study both groups differed significantly in the scores of Verbal N1 back and N2 back tests.

Our findings were similar to study by Paterson et al., who demonstrated severe neurocognitive deficits in alcohol dependence, that substance use disorders in general[79].

Findings on the variable analysis

In our study, age of onset of alcohol use was associated with unemployed status of bipolar illness.

In our study duration of alcohol use was associated positively with total no. of episodes, no. of manic episodes, no. of mixed episodes and no. of hospitalizations.

Our study showed that neuroticism scores were positively associated with duration of alcohol use and SADQ scores. Higher scores on neuroticism trait may point towards predisposition to alcohol dependence in bipolar disorder.

Our study showed that duration of alcohol use and SAD Q scores were associated poor performance in FAB subsets in areas of sensitivity to interference, mental flexibility, motor programming and inhibitory control. SADQ scores were associated with poor performance in areas of conceptualisation and environmental autonomy. These results show that cognitive deficits were more prominent with the severity of dependence.

Our study showed that duration of alcohol use and SAD Q scores were associated poor performance in Digit symbol substitution test and Stroop test. David F Marshall et al., also demonstrated significant effect of substance use on conceptual reasoning in bipolar patients with substance use disorders[99].

LIMITATIONS

1. This is a retrospective study with potential recall bias of the events of illness.

2. One of the major limitations was use of drugs in subjects. The medications used by the subjects were not taken into account. There might be a disparity in the drugs used. There is possibility that mood stabilizers and anti psychotics might affect results of cognitive testing. But it is unethical to withdraw medications for the study, since this might precipitate an episode.

3. The size of sample was small. Larger sample size is required for more refined analysis and might have revealed more differences between groups.

4. The study was cross-sectional and a longitudinal follow up is required to evaluate the evolution of neurocognitive deficits.

5. Since the assessor was not blinded to the subjects, the results obtained could be biased. Thus independent assessor is necessary to overcome the limitation.

6. Results could not be generalized to minority groups as they were not represented in the sample since ethnicity and culture may play a role in cognitive functioning.

7. Validation of Tamil version of tests are still inadequate.

8. The study excluded the subjects with other substance use and the effect of multiple substance use was not considered for the study.

CONCLUSIONS

- There is a greater predisposition to develop alcohol use disorders in bipolar patients with high scores on openness to experience.
- Bipolar patients with very high neuroticism score are predisposed to alcohol use disorders.
- Neuroticism score is associated positively with scores on severity of alcohol dependence.
- There is increased number of hospitalization in bipolar patients with comorbid alcohol use disorders.
- There are increased dysphoric episodes in bipolar patients with comorbid alcohol use disorders.
- There are increased deficits in response inhibition in bipolar patients with comorbid alcohol use disorders.
- There are increased deficits in response speed in bipolar patients with comorbid alcohol use disorders.
- There are increased deficits in executive functions in bipolar patients with comorbid alcohol use disorders.
- There are increased deficits in executive functions in bipolar patients with longer duration of alcohol use and severe dependence pattern.

FUTURE DIRECTIONS

1. Assessment of personality traits routinely in subjects during onset of illness may be helpful in anticipation and prevention of comorbid alcohol use disorders occurring.

2. Cognitive functioning should be assessed routinely at the onset of illness which might help us to evaluate if cognitive deficit at onset predisposes to occurrence of comorbid alcohol use disorders.

3. Treatment and rehabilitation interventions should take into account the presence of comorbid illness and intervention strategies should be planned accordingly.

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(ANNEXURE 1)

PROFOMA

S.No. OP No. Unit: Date:

Socio-demographic Profile of Patient.

Name:							
Age:							
Sex:		male			Female		
Education:	Illiterate	Primary school	Middle school	High school	Higher sec/diploma	Graduate/ PG	Professional
Occupation:	Unemployed	Unskilled worker	Semi skilled	Skilled	Clerical/ owner/ Farmer	Semi-Professional	Professional
Income	≤ 1520	1521-4550	4551-7593	7594-11361	11362-15187	15188-30374	≥30375
SES	Lower	Lower middle	Middle	Upper middle	Upper		
Marital status:	Never married		Married& staying		Separated/ Divorced/Widowed		
Habitat		Rural			Urban		
Language		Tamil		Hindi		Others	
Religion		Hinduism	Islam		Christianity	Others	

History:

Age of onset of illness			
Duration of illness			
No. of hospitalizations			
Total No. of episodes	Depressive episodes	Mania episodes	mixed
Avg. Duration of the longest episode			
No. of suicide attempts			
h/o Alcohol use	absent	Present	
If present, Age of onset of alcohol use			

Current use of Alcohol		nil	Use	abuse	dependence
Life time use of Alcohol		nil	use	abuse	dependence
Alcohol indices	Audit scores				
	SADQ				
NEO FFI	*Neuroticism*				
	Extraversion				
	Openness to Experience				
	Agreeableness				
	Conscientiousness				
FAB	*conceptualization*				
	mental flexibility				
	programming				
	sensitivity to interference				
	inhibitory control				
	environmental autonomy				
Stroop test					
Digit-symbol substitution test					
N back test					

ANNEXURE 2

Australian Government
Department of Veterans' Affairs

Alcohol Screen (AUDIT)

THE RIGHT MIX

Light Beer	Full Strength Beer	Wine	Fortified Wine	Spirits	Full Strength Can or Stubbie
425ml	285ml	100ml	60ml	30ml	375ml
2.9% Alcohol	4.9% Alcohol	12% Alcohol	20% Alcohol	40% Alcohol	4.9% Alcohol

The guide above contains examples of ***one standard drink***.

A full strength can or stubbie contains ***one and a half standard drinks***.

Introduction

Because alcohol use can affect health and interfere with certain medications and treatments, it is important that we ask you some questions about your use of alcohol. Your answers will remain confidential, so please be as accurate as possible. Try to answer the questions in terms of **'standard drinks'**. Please ask for clarification if required.

AUDIT Questions Please tick the response that best fits your drinking.

						Score	Sub totals
	Never	*Monthly or less*	*2 - 4 times a month*	*2 - 3 times a week*	*4 or more times a week*		
1. How often do you have a drink containing alcohol?	☐ Go to Qs 9 & 10	☐	☐	☐	☐		
	1 or 2	*3 or 4*	*5 or 6*	*7 to 9*	*10 or more*		
2. How many standard drinks do you have on a typical day when you are drinking?	☐	☐	☐	☐	☐		
	Never	*Less than monthly*	*Monthly*	*Weekly*	*Daily or almost daily*		
3. How often do you have six or more standard drinks on one occasion ?	☐	☐	☐	☐	☐		
4. How often during the last year have you found that you were not able to stop drinking once you had started?	☐	☐	☐	☐	☐		
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	☐	☐	☐	☐	☐		
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	☐	☐	☐	☐	☐		
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	☐	☐	☐	☐	☐		
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?	☐	☐	☐	☐	☐		
	No		*Yes, but not in the last year*		*Yes, during the last year*		
9. Have you or someone else been injured because of your drinking?	☐		☐		☐		
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	☐		☐		☐		
						TOTAL	

Supplementary Questions	*No*	*Probably Not*	*Unsure*	*Possibly*	*Definitely*
Do you think you presently have a problem with drinking?	☐	☐	☐	☐	☐
	Very easy	*Fairly easy*	*Neither difficult nor easy*	*Fairly difficult*	*Very difficult*
In the next 3 months, how difficult would you find it to cut down or stop drinking?	☐	☐	☐	☐	☐

ANNEXURE 2 (contd..)

How to score and interpret the AUDIT

The World Health Organization's Alcohol Use Disorders Identification Test (AUDIT) is a very reliable and simple screening tool which is sensitive to early detection of risky and high risk (or hazardous and harmful) drinking. It has three questions on alcohol consumption (**1 to 3**), three questions on drinking behaviour and dependence (**4 to 6**) and four questions on the consequences or problems related to drinking (**7 to 10**).

The **Supplementary Questions** do not belong to the AUDIT and are **not** scored. They provide useful clinical information associated with the client's perception of whether they have an alcohol problem and their confidence that change is possible in the short-term. They act as an indication of the degree of intervention required and provide a link to counselling or brief intervention following feedback of the AUDIT score to the client.

Scoring the AUDIT

- The columns in the AUDIT are scored from left to right.
- **Questions 1 to 8** are scored on a five-point scale from **0, 1, 2, 3,** and **4**.
- **Questions 9 & 10** are scored on a three -point scale from **0, 2** and **4**.
- Record the score for each question in the **"score"** column on the right, including a zero for questions **2 to 8** if 'skipped'.
- Record a total score in the **"TOTAL"** box at the bottom of the column. The maximum score is 40.

Consumption score

Add up **questions 1 to 3** and place this sub-score in the adjacent single box in the far right column (maximum score possible = 12). A score of 6 or 7 may indicate a risk of alcohol-related harm, even if this is also the total score for the AUDIT (e.g. consumption could be over the recommended weekly intake of 28 for men and 14 for females in the absence of scoring on any other questions). Drinking may also take place in dangerous situations (e.g. driving, fishing/boating). Scores of 6 to 7 may also indicate potential harm for those groups more susceptible to the effects of alcohol, such as young people, women, the elderly, people with mental health problems and people on medication. Further inquiry may reveal the necessity for harm reduction advice.

Dependence score

Add up **questions 4 to 6** and place this sub-score in the adjacent single box in the far right column (maximum score possible = 12). In addition to the total AUDIT score, a secondary 'dependence' score of 4 or more as a subtotal of questions 4 to 6, suggests the possibility of alcohol dependence (and therefore the need for more intensive intervention if further assessment confirms dependence).

Alcohol-related problems score

Any scoring on **questions 7 to 10** warrants further investigation to determine whether the problem is of current concern and requires intervention.

AUDIT Total score	*Dependence score*	*Risk level*	*Possible Interventions*
0 - 7	below 4	**Low-risk**	• Use 'Right Mix' materials to reinforce low-risk drinking, particularly for those who previously had alcohol problems or whose circumstances may change. • Harm reduction advice may be appropriate for those in susceptible groups (see 'Consumption Score' above).
8 - 15	below 4	**Risky** or **hazardous level.** Moderate risk of harm. May include some clients currently experiencing harm (especially those who have minimised their reported intake and problems).	• Brief Intervention - feedback of AUDIT and harm reduction advice may be sufficient Ideally also: - setting goals and limits - a motivational interview - self-monitoring of drinking - use of "The Right Mix" self-help guide
	4 or more	Assess for dependency	• Counselling may be required.
16 - 19	below 4	**High-risk** or **harmful level.** Drinking that will eventually result in harm, if not already doing so. May be dependent.	• Brief Intervention (all components) is a minimum requirement. • Assessment for more intensive intervention. • Counselling using CBT principles and motivational interviewing in individual sessions and/or in groups. • Follow-up and referral where necessary.
	4 or more	Assess for dependence	
20 or more	below 4	**High-risk** Definite harm, also likely to be alcohol dependent. Assess for dependence.	• Further assessement preferably including family and significant others. • More intensive counselling and/or group program. • Consider referral to medical or specialist services for withdrawal management.
	4 or more	**Almost certainly dependent.** Assess for dependency.	• Pharmacotherapy to manage cravings. • Relapse prevention, longer-term follow-up and support.

ANNEXURE 3

SEVERITY OF ALCOHOL DEPENDENCE QUESTIONAIRE

Please recall a typical period of heavy drinking in the last 6 months.

During that period of heavy drinking

1. The day after drinking alcohol, I woke up feeling sweaty.

2. The day after drinking alcohol, my hands shook first thing in the morning.

3. The day after drinking alcohol, my whole body shook violently first thing in the morning if I didn't have a drink.

4. The day after drinking alcohol, I woke up absolutely drenched in sweat.

5. The day after drinking alcohol, I dread waking up in the morning.

6. The day after drinking alcohol, I was frightened of meeting people first thing in the morning.

7. The day after drinking alcohol, I felt at the edge of despair when I awoke.

8. The day after drinking alcohol, I felt very frightened when I awoke.

9. The day after drinking alcohol, I liked to have an alcoholic drink in the morning.

10. The day after drinking alcohol, I always gulped my first few alcoholic drinks down as quickly as possible.

11. The day after drinking alcohol, I drank more alcohol to get rid of the shakes.

12. The day after drinking alcohol, I had a very strong craving for a drink when I awoke.

13. I drank more than a quarter of a bottle of spirits in a day (OR 1 bottle of wine OR 8 units of beers).

14. I drank more than half a bottle of spirits per day (OR 1.5 bottles of wine OR 15 units of beer).

15. I drank more than one bottle of spirits per day (OR 3 bottles of wine OR 30 units of beer).

16. I drank more than two bottles of spirits per day (OR 6 bottles of wine OR 60 units of beer)

Imagine the following situation:

1. You have been **completely off drink for a few weeks**
2. You then drink **very heavily** for **two days**

How would you feel the **morning after** those two days of drinking?

17. I would start to sweat.

18. My hands would shake.

19. My body would shake.

20. I would be craving for a drink.

Scoring

Answers to each question are rated on a four-point scale:

Almost never / Not at all	-	0
Sometimes /Slightly	-	1
Often /moderately	-	2
Nearly always /quite a lot	-	3

A score of 31 or higher indicates "severe alcohol dependence".

A score of 16 -30 indicates "moderate dependence"

A score of below 16 usually indicates only a mild physical dependency.

ANNEXURE 4

NEO Five-Factor Inventory (NEO-FFI) Form S

1	**I am not a worrier.**
2	I like to have a lot of people around me.
3	**I don't like to waste my time daydreaming.**
4	I try to be courteous to everyone I meet.
5	I keep my belongings neat and clean.
6	I often feel inferior to others.
7	I laugh easily.
8	**Once I find the right way to do something, I stick to it**
9	**I often get into arguments with my family and co-workers**
10	I'm pretty good about pacing myself so as to get things done on time.
11	When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.
12	**I don't consider myself especially "light-hearted."**
13	I am intrigued by the patterns I find in art and nature
14	**Some people think I'm selfish and egotistical.**
15	**I am not a very methodical person.**
16	**I rarely feel lonely or blue.**
17	I really enjoy talking to people.
18	**I believe letting students hear controversial speakers can only confuse and mislead them.**
19	I would rather cooperate with others than compete with them
20	I try to perform all the tasks assigned to me conscientiously
21	I often feel tense and jittery.
22	I like to be where the action is.
23	**Poetry has little or no effect on me.**
24	**I tend to be cynical and skeptical of others' intentions**
25	I have a clear set of goals and work toward them in an orderly fashion
26	Sometimes I feel completely worthless.
27	**I usually prefer to do things alone.**
28	I often try new and foreign foods.
29	**I believe that most people will take advantage of you if u let them**
30	**I waste a lot of time before settling down to work.**
31	**I rarely feel fearful or anxious.**
32	I often feel as if I'm bursting with energy.
33	**I seldom notice the moods or feelings that different environment produce**
34	Most people I know like me.
35	I work hard to accomplish my goals.
36	I often get angry at the way people treat me.
37	I am a cheerful, high-spirited person.

38	**I believe we should look to our religious authorities for decisions on moral issues.**
39	**Some people think of me as cold and calculating.**
40	When I make a commitment, I can always be counted on to follow through.
41	Too often, when things go wrong, I get discouraged and feel like giving up.
42	**I am not a cheerful optimist.**
43	Sometimes when I am reading poetry or looking at a work of art, I feel a wave of excitement.
44	**I'm hard-headed and tough-minded in my attitudes.**
45	**Sometimes I'm not as dependable or reliable as I should be.**
46	**I am seldom sad or depressed.**
47	My life is fast-paced.
48	**I have little interest in speculating on the nature of the universe or the human condition.**
49	I generally try to be thoughtful and considerate.
50	I am a productive person who always gets the job done
51	I often feel helpless and want someone else to solve my problems.
52	I am a very active person.
53	I have a lot of intellectual curiosity.
54	**If I don't like people, I let them know it.**
55	**I never seem to be able to get organized.**
56	At times I have been so ashamed I just wanted to hide
57	**I would rather go my own way than be a leader of others**
58	I often enjoy playing with theories or abstract ideas
59	If necessary, I am willing to manipulate people to get what I want
60	I strive for excellence in everything I do.

For the non-reversed-scored items, SD=0, D=1, N=2, A=3, SA=4.
For the reversed-scored items, SD=4, D=3, N=2, A=1, SA=0.
Shaded items are reverse score items.

N: **1**, 6, 11, **16**, 21, 26, **31**, 36, 41, **46**, 51, 56
E: 2, 7, **12**, 17, 22, **27**, 32, 37, **42**, 47, 52, **57**.
O: **3**, **8**, 13, **18**, **23**, 28, **33**, **38**, 43, **48**, 53, 58.
A: 4, **9**, **14**, 19, **24**, **29**, 34, **39**, **44**, 49, **54**, 59.
C: 5, 10, **15**, 20, 25, **30**, 35, 40, **45**, 50, **55**, 60.

Compared to males in the normative sample:
N: < 13 low :(< 6 very low) >21 high (> 29 very high) Otherwise, average
E: < 24 low (< 18 very low) > 30 high (>36 very high) Otherwise, average
O: < 23 low (<18 very low) > 30 high (> 36 very high) Otherwise, average.
A: < 29 low (< 24 very low) >35 high (> 40 very high) Otherwise average
C: < 30 low <25 very low) >37 high (> 43 very high)Otherwise average

ANNEXURE 5

FRONTAL ASSESSMENT BATTERY

1. Similarities (conceptualization)

"In what way are they alike?"

- A banana and an orange
- A table and a chair
- A tulip, a rose and a daisy

Score (only category responses [fruits, furniture, flowers] are considered correct)

Three correct: 3 Two correct: 2 One correct: 1 None correct: 0

2. Lexical fluency (mental flexibility)

"Say as many words as you can begin with the letter 'S,' any words except surnames or proper nouns."

Score (word repetitions or variations [shoe, shoemaker], surnames, or proper nouns are not counted as correct responses)

> 9 words: 3 6 -9 words: 2 3 -5 words: 1 < 3 words: 0

3. Motor series "Luria" test (programming)

"Look carefully at what I'm doing."

The examiner, seated in front of the patient, performs alone three times with his left hand the series of "fist–edge–palm."

"Now, with your right hand do the same series, first with me, then alone."

The examiner performs the series three times with the patient, then says to him/her:

"Now, do it on your own."

Score

Patient performs six correct consecutive series alone: 3
Patient performs at least three correct consecutive series alone: 2

Patient fails alone, but performs three correct consecutive series with the examiner: 1

Patient cannot perform three correct consecutive series even with the examiner: 0

4. Conflicting instructions (sensitivity to interference)

"Tap twice when I tap once."

To ensure that the patient has understood the instruction, a series of 3 trials is run: 1-1-1. “Tap once when I tap twice.” To ensure that the patient has understood the instruction, a series of 3 trials is run: 2-2-2.

The examiner then performs the following series: 1-1-2-1-2-2-2-1-1-2.

Score No errors: 3 1 -2 errors: 2 > 2 errors: 1

Patient taps like the examiner at least four consecutive times: 0

5. Go–No Go (inhibitory control)

“Tap once when I tap once.” To ensure that the patient has understood the instruction, a series of 3 trials is run: 1-1-1.

“Do not tap when I tap twice.” To ensure that the patient has understood the instruction, a series of 3 trials is run: 2-2-2.

The examiner then performs the following series: 1-1-2-1-2-2-2-1-1-2.

Score No errors: 3 1 -2 errors: 2 > 2 errors: 1

Patient taps like the examiner at least four consecutive times: 0

6. Prehension behaviour (environmental autonomy)

“Do not take my hands.”

The examiner is seated in front of the patient. Place the patient’s hands palm up on his knees. Without saying anything or looking at the patient, the examiner brings his own hands close to the patient’s hands and touches the palms of both the patient’s hands, to see if he will spontaneously take them. If the patient takes the examiner’s hands, try again after asking the patient: “Now, do not take my hands.”

Score

Patient does not take the examiner’s hands: 3

Patient hesitates and asks what he/she has to do: 2

Patient takes the hands without hesitation: 1

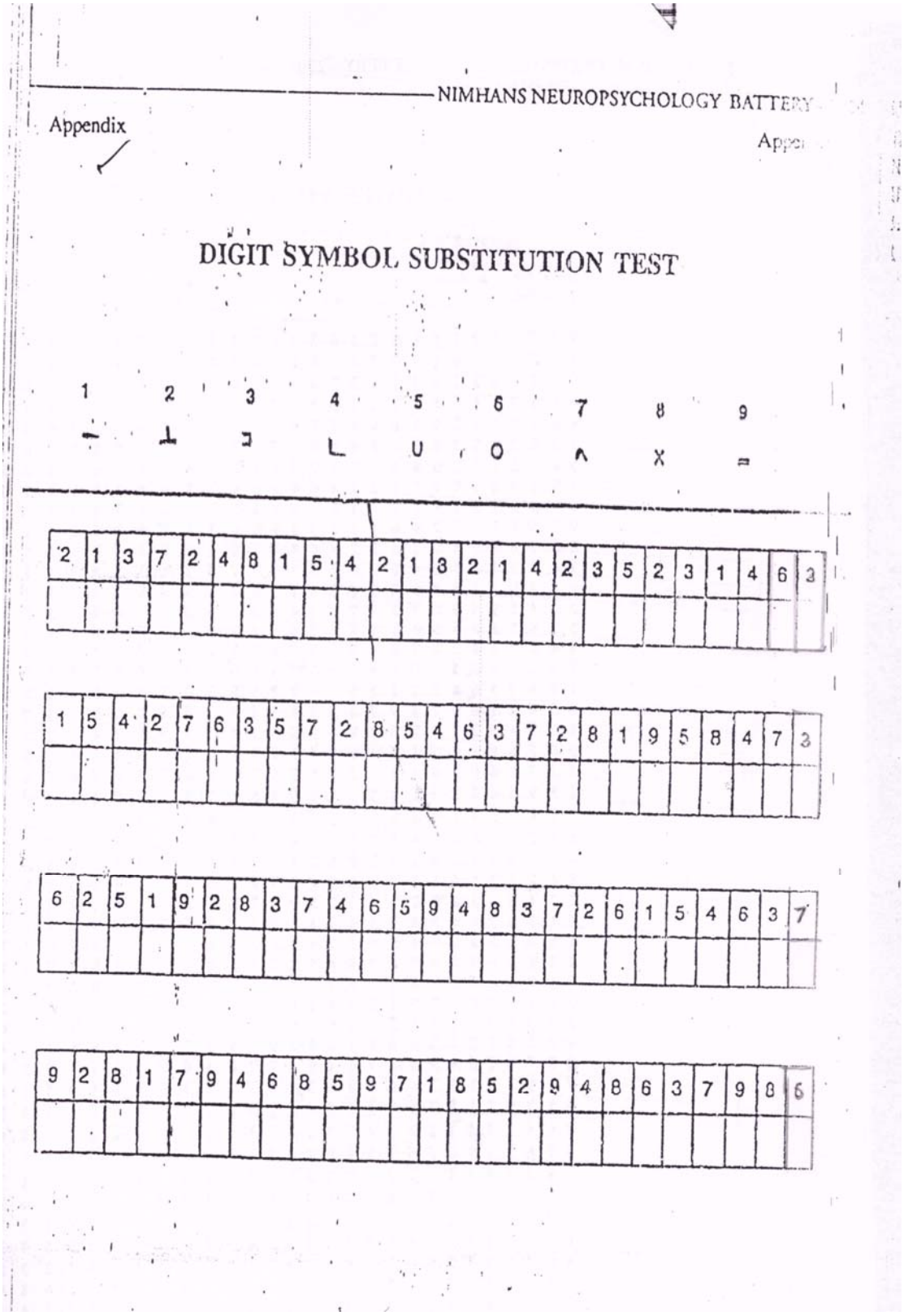
Patient takes the examiner’s hand even after he has been told not to do so: 0

Interpreting results

A cut off score of 12 on the FAB has a sensitivity of 77% and specificity of 87% in differentiating between frontal dysexecutive type dementias and DAT

ANNEXURE 6

DIGIT SYMBOL SUBSTITUTION TEST



NIMHANS NEUROPSYCHOLOGY BATTERY

Appendix

DIGIT SYMBOL SUBSTITUTION TEST

1	2	3	4	5	6	7	8	9
⊢	⊥	⊐	∟	∪	○	∧	X	=

2	1	3	7	2	4	8	1	5	4	2	1	3	2	1	4	2	3	5	2	3	1	4	6	3

1	5	4	2	7	6	3	5	7	2	8	5	4	6	3	7	2	8	1	9	5	8	4	7	3

6	2	5	1	9	2	8	3	7	4	6	5	9	4	8	3	7	2	6	1	5	4	6	3	7

9	2	8	1	7	9	4	6	8	5	9	7	1	8	5	2	9	4	8	6	3	7	9	8	6

NORMATIVE DATA –DIGIT SYMBOL SUBSTITUTION TEST

Table 3.3 Digit Symbol Substitution Test Literate Males — Total Time Mean, S.D, Percentiles for each age x education category

	Males											
	16-30 Years				31-50 Years				51-65 Years			
	School educated		College educated		School educated		College educated		School educated		College educated	
N	33		32		32		39		39		39	
Mean TT	276.57		191.48		259.47		205.65		351.54		218.79	
SD	109.95		53.36		107.62		38.67		137.53		65.59	
	TT	Percentiles	TT	Percentiles	TT	Percentiles	TT	Percentiles	TT	Percentiles	TT	Percentiles
	607	3	395	3	639	3	297	3	705	3	452	3
	561	6	315	6	505	6	282	5	615	5	345	5
	472	9	245	9	494	9	268	8	604	8	341	8
	457	12	240	12	342	13	263	10	600	10	285	13
	362	15	238	15	328	16	254	13	588	13	281	15
	349	18	231	18	310	19	248	18	583	15	277	18
	348	21	215	21	309	22	238	20	475	18	274	21
	343	24	207	24	298	25	237	23	443	21	262	23
	324	27	205	30	283	28	236	25	413	23	250	26
	285	30	204	33	259	31	234	30	412	26	243	28
	268	33	201	36	254	34	233	33	410	28	238	31
	266	36	187	42	247	38	218	35	396	31	230	33
	263	39	184	46	240	41	209	38	389	33	229	36
	246	46	178	52	237	44	207	40	357	36	228	39
	242	49	174	55	236	50	206	43	355	39	226	41
	239	52	169	61	235	53	205	45	353	41	220	44
	235	55	167	64	221	56	204	48	349	44	217	46
	230	58	166	73	215	59	200	50	346	46	210	49
	229	61	164	76	209	63	197	53	332	49	205	51
	228	64	163	79	208	66	196	55	325	51	202	54
	220	67	160	82	207	69	194	58	319	54	201	56
	218	70	156	85	199	72	192	63	304	56	200	59
	214	73	154	88	195	75	191	65	300	59	197	62
	206	76	152	91	194	78	189	68	291	62	194	64

Table Contd.....

NORMATIVE DATA –DIGIT SYMBOL SUBSTITUTION TEST

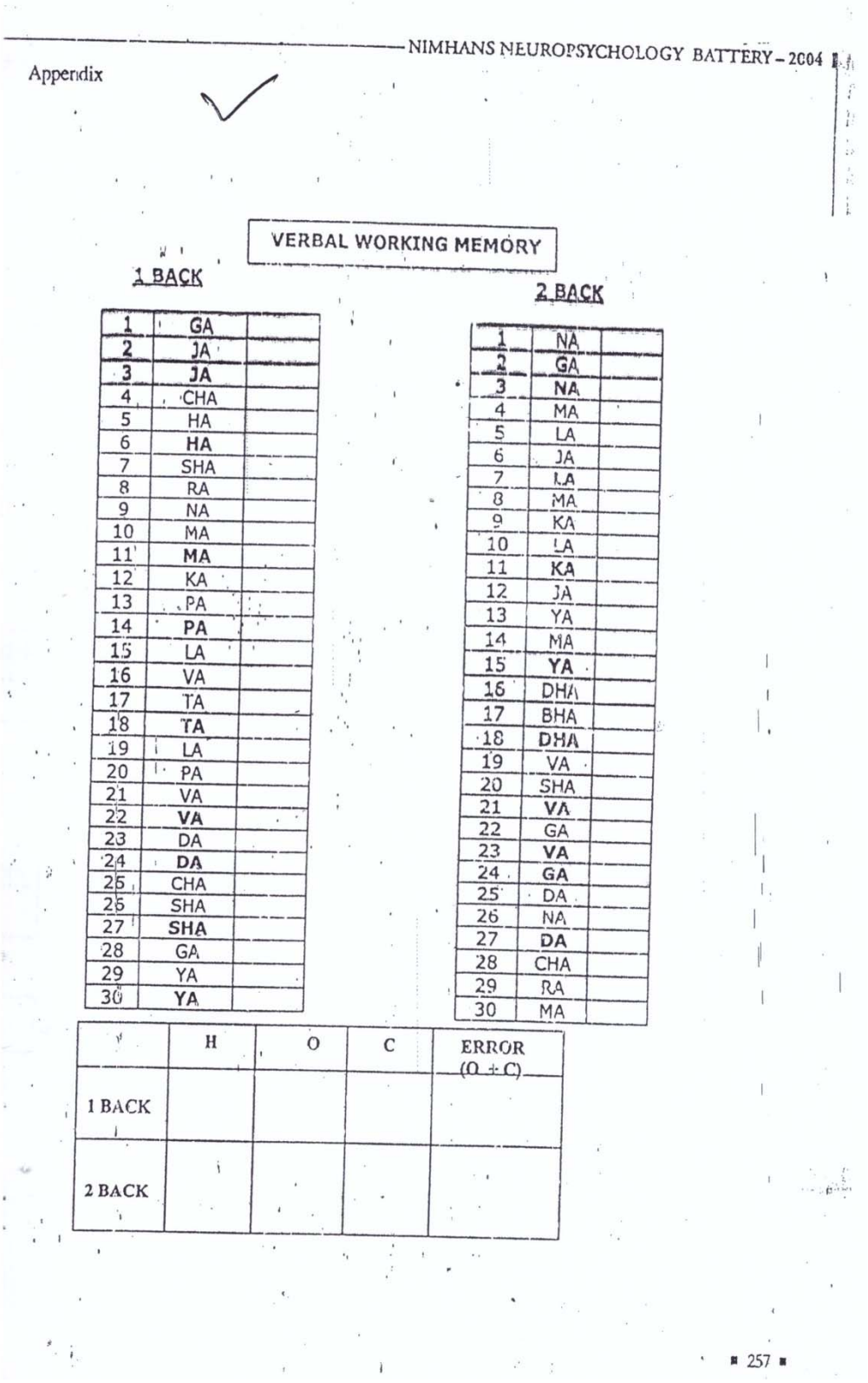
Males

16-30 Years				31-50 Years				51-65 Years			
School educated		College educated		School educated		College educated		School educated		College educated	
TT	Percentiles	TT	Percentiles	TT	Percentiles	TT	Percentiles	TT	Percentiles	TT	Percentiles
204	79	135	94	192	81	185	70	288	64	185	67
200	85	122	97	188	84	183	73	276	67	180	69
193	91	121	100	172	88	182	75	266	69	179	72
183	94			169	91	181	78	265	72	176	74
148	100			165	94	180	80	249	74	172	77
				164	97	175	83	245	77	168	80
				153	100	166	85	231	80	161	82
						165	88	226	82	158	85
						159	90	225	85	155	87
						155	93	219	87	153	90
						151	95	209	90	152	92
						138	98	202	92	148	95
						134	100	198	95	134	97
								194	97	120	100
								153	100		

Note: TT = Total Time

ANNEXURE 7

VERBAL N BACK TEST (A



Appendix

VERBAL WORKING MEMORY

1 BACK

1	GA	
2	JA	
3	JA	
4	CHA	
5	HA	
6	HA	
7	SHA	
8	RA	
9	NA	
10	MA	
11	MA	
12	KA	
13	PA	
14	PA	
15	LA	
16	VA	
17	TA	
18	TA	
19	LA	
20	PA	
21	VA	
22	VA	
23	DA	
24	DA	
25	CHA	
26	SHA	
27	SHA	
28	GA	
29	YA	
30	YA	

2 BACK

1	NA	
2	GA	
3	NA	
4	MA	
5	LA	
6	JA	
7	LA	
8	MA	
9	KA	
10	LA	
11	KA	
12	JA	
13	YA	
14	MA	
15	YA	
16	DHA	
17	BHA	
18	DHA	
19	VA	
20	SHA	
21	VA	
22	GA	
23	VA	
24	GA	
25	DA	
26	NA	
27	DA	
28	CHA	
29	RA	
30	MA	

	H	O	C	ERROR (O + C)
1 BACK				
2 BACK				

NORMATIVE DATA –VERBAL N BACK TEST

Table 10.3 Verbal N Back Test – Literate Males – Hits
Mean, S.D., Percentiles for each age x education category

		Males											
		16-30 years				31-50 years				51-65 years			
		School Educated		College Educated		School Educated		College Educated		School Educated		College Educated	
		1 back	2 back	1 back	2 back	1 back	2 back	1 back	2 back	1 back	2 back	1 back	2 back
N		32	31	32	32	30	29	34	34	37	37	38	38
Mean Hits		8.16	6.74	8.09	6.91	7.97	6.41	8.53	7.29	8.22	6.38	8.68	7.11
SD		1.30	1.63	0.64	1.73	1.00	1.55	0.82	1.06	0.98	1.65	0.74	1.06
		Hits	Hits	Hits	Hits	Hits	Hits	Hits	Hits	Hits	Hits	Hits	Hits
PERCENTILES	5	5	3	7	3	6	3	7	6	6	3	8	5
	10	6	4	8	4	7	5	8	6	7	4	8	6
	15	7	5	8	5	7	5	8	6	7	4	8	6
	20	8	5	8	5	7	5	8	6	7	5	8	6
	25	8	6	8	6	8	6	8	7	8	5	9	6
	30	8	6	9	6	8	6	8	7	8	5	9	7
	40	8	7	9	7	8	6	9	7	8	6	9	7
	50	9	7	9	7	8	7	9	7	9	7	9	7
	60	9	8	9	8	8	7	9	8	9	7	9	8
	70	9	8	9	8	9	8	9	8	9	8	9	8
	75	9	8	9	8	9	8	9	8	9	8	9	8
	80	9	8	9	8	9	8	9	8	9	8	9	8
	85	9	8	9	9	9	8	9	9	9	8	9	8
	90	9	8	9	9	9	8	9	9	9	8	9	8
	95	9	8	9	9	9	8	9	9	9	8	9	9

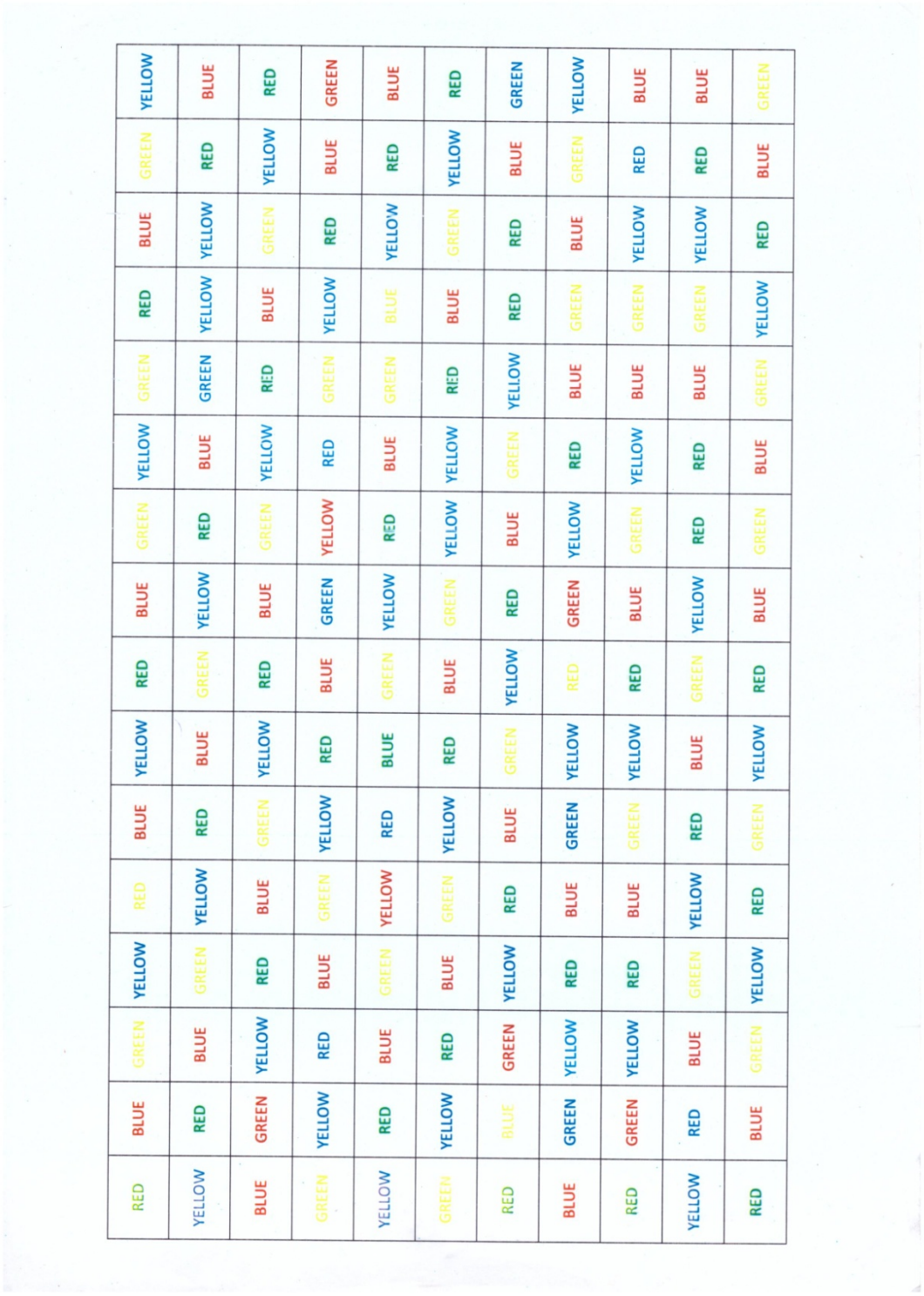
NORMATIVE DATA –VERBAL N BACK TEST

Table 10.4 Verbal N Back Test – Literate Males – Errors
Mean, S.D., Percentiles for each age x education category

Males																								
	16-30 years								31-50 years								51-65 years							
	School educated				College educated				School educated				College educated				School educated				College educated			
N	32		31		32		32		30		29		34		34		37		37		38		38	
	1 back		2 back		1 back		2 back		1 back		2 back		1 back		2 back		1 back		2 back		1 back		2 back	
Mean Error	1.45		4.00		0.72		3.34		2.60		4.45		0.70		0.70		1.22		3.73		0.68		3.26	
SD	2.81		3.31		1.05		1.99		3.01		3.25		1.03		1.03		1.38		2.24		1.04		2.19	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
	13	3	15	3	3	13	4	3	13	3	17	3	4	3	8	3	5	3	10	3	5	3	9	5
	8	7	12	7	2	19	3	6	8	7	10	7	3	6	7	15	4	8	8	8	2	18	7	11
	5	10	9	10	1	41	2	21	7	13	7	17	2	21	6	18	3	19	6	14	1	42	6	16
	4	13	7	19	0	100	1	41	6	17	6	28	1	41	5	29	2	32	5	41	0	100	5	21
	3	19	6	26			0	100	4	27	5	38	0	100	4	44	1	60	4	54			4	34
	2	23	5	32					3	33	4	59			3	62	0	100	3	65			3	58
	1	45	3	48					2	57	3	72			2	79			2	81			2	79
	0	100	2	97					1	73	2	86			1	94			1	97			1	97
			0	100					0	100	1	100			0	100			0	100			0	100
	Note: E = Number of Errors; P = Percentiles																							

ANNEXURE 8

STROOP TEST



STROOP TEST

பச்சை	சிவப்பு	மஞ்சள்	நீலம்	பச்சை	மஞ்சள்	சிவப்பு	நீலம்	பச்சை	மஞ்சள்	சிவப்பு	நீலம்	பச்சை	மஞ்சள்	சிவப்பு	நீலம்	பச்சை	மஞ்சள்	சிவப்பு	நீலம்
மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை
நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை
மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை
பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு
மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை
சிவப்பு	நீலம்	மஞ்சள்	பச்சை	சிவப்பு	நீலம்	மஞ்சள்	பச்சை	சிவப்பு	நீலம்	மஞ்சள்	பச்சை	சிவப்பு	நீலம்	மஞ்சள்	பச்சை	சிவப்பு	நீலம்	மஞ்சள்	பச்சை
மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை
நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை	நீலம்	மஞ்சள்	சிவப்பு	பச்சை
சிவப்பு	மஞ்சள்	நீலம்	பச்சை	சிவப்பு	மஞ்சள்	நீலம்	பச்சை	சிவப்பு	மஞ்சள்	நீலம்	பச்சை	சிவப்பு	மஞ்சள்	நீலம்	பச்சை	சிவப்பு	மஞ்சள்	நீலம்	பச்சை
மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை
நீலம்	சிவப்பு	மஞ்சள்	பச்சை	நீலம்	சிவப்பு	மஞ்சள்	பச்சை	நீலம்	சிவப்பு	மஞ்சள்	பச்சை	நீலம்	சிவப்பு	மஞ்சள்	பச்சை	நீலம்	சிவப்பு	மஞ்சள்	பச்சை
மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை	மஞ்சள்	நீலம்	சிவப்பு	பச்சை

NORMATIVE DATA –STROOP TEST

Table 15.2 Stroop Test – Literate Females – Sample Characteristics for each age x education category

Females												
	16-30 years				31-50 years				51-65 years			
	School educated		College educated		School educated		College educated		School educated		College educated	
N	32		30		30		30		26		36	
	Age	Edn.	Age	Edn.	Age	Edn.	Age	Edn.	Age	Edn.	Age	Edn.
Mean	22.09	9.03	24.00	16.57	40.27	8.23	39.00	15.43	55.65	7.96	55.26	14.51
SD	4.69	1.47	3.32	2.76	4.86	2.03	6.53	2.33	4.11	2.47	5.01	2.03
Note: Edn.=Education												

Table 15.3 Stroop Test – Literate Males – Stroop Effect Mean, S.D., Percentiles for each age x education category

Males												
	16-30 years				31-50 years				51-65 years			
	School educated		College educated		School educated		College educated		School educated		College educated	
N	34		31		31		33		30		35	
Mean SE	160.71		151.16		156.26		149.82		184.60		183.10	
SD	76.44		46.65		85.64		49.26		107.57		82.51	
	SE	Percentiles	SE	Percentiles	SE	Percentiles	SE	Percentiles	SE	Percentiles	SE	Percentiles
	381	3	288	3	434	3	261	3	536	3	368	3
	346	6	214	7	352	7	250	6	405	6	350	7
	295	9	213	10	267	10	215	9	402	9	333	10
	229	15	211	13	264	13	199	12	397	11	320	13
	215	18	210	16	257	16	196	15	283	14	274	17
	200	21	200	19	209	19	193	18	254	17	252	20
	197	24	181	23	199	23	192	21	240	20	244	23
	195	27	178	26	192	26	186	24	238	23	242	27
	192	29	176	29	173	29	185	27	215	26	233	30
	188	32	172	32	161	32	169	30	209	29	205	33

Table Contd..

NORMATIVE DATA –STROOP TEST

Males												
16-30 years				31-50 years				51-65 years				
School educated		College educated		School educated		College educated		School educated		College educated		
SE	Percentiles	SE	Percentiles	SE	Percentiles	SE	Percentiles	SE	Percentiles	SE	Percentiles	
178	35	167	36	156	36	163	33	202	31	181	37	
170	38	164	39	150	39	161	36	196	34	172	43	
162	41	163	42	145	42	155	39	189	37	161	47	
160	47	149	45	141	45	154	42	185	40	160	50	
158	50	148	48	136	52	152	46	182	43	159	53	
151	53	138	52	135	55	150	49	167	46	151	57	
144	56	135	55	132	58	149	52	145	49	147	60	
138	59	133	58	130	61	148	58	140	51	146	63	
135	62	131	65	125	65	147	61	138	54	143	67	
134	65	130	68	120	68	138	67	136	57	139	70	
133	68	126	71	111	71	136	70	135	60	135	73	
131	71	125	74	102	74	128	73	130	63	130	77	
124	74	124	77	101	77	126	76	126	66	128	80	
123	77	121	81	92	81	124	79	125	69	114	83	
114	79	112	84	90	84	120	82	121	71	112	87	
108	82	100	90	88	87	107	85	120	74	95	90	
98	85	85	94	85	90	87	88	118	77	93	93	
77	88	82	97	78	94	86	91	113	80	90	97	
73	91	79	100	55	97	84	94	108	83	44	100	
55	94			28	100	78	97	106	86			
54	97					19	100	98	91			
17	100							75	94			
								70	97			
								59	100			

Note: SE = Stroop Effect

INFORMATION SHEET

- You have been selected to participate in this study.
- We are conducting a study **"To determine the personality traits, clinical characteristics and cognitive functions in bipolar disorder patients with comorbid alcohol use disorders"** in Institute of Mental Health under Madras Medical College and for that your participation may be of value to us.
- Bipolar disorder is a psychiatric illness and co-occurring alcohol use disorders, worsens the severity of disease and cognitive functions. Personality traits of a person may predispose to alcohol use disorders in bipolar disorder patients.
- We will be asking you set of questions from standard questionnaires approved by ethical committee on one to one basis and your responses will be recorded. The interview will take about 30-45 minutes.
- The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.
- Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.
- The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of investigator Signature of participant

Date:

ஆராய்ச்சி தகவல் தாள்

தலைப்பு:

பைபோலார் எனும் மனநோய் மற்றும் மதுபழக்கம் உள்ளவர்களுக்கு உள்ள தனிமனித சுபாவங்கள், நோயின் தண்மை மற்றும் செயல்பாடு பற்றி ஆராய்தல்

ஆராய்ச்சியாளரின் பெயர்: மரு. அகல்யா. டி

பங்குகொள்வரின் பெயர்

மருத்துவ நிலையம்: அரசு மனநல காப்பகம், சென்னை

மதுபழக்கத்தினால் ஏற்படும் மனநோயிற்கான சமூக மற்றும் தனிமனித சுபாவ காரணிகளை பற்றிய ஆய்வு நடைபெறுகிறது. நீங்களும் இந்த ஆராய்ச்சியில் பங்கேற்க விரும்புகிறோம்.

உங்களுக்கு ஆராய்க்காக ஒப்புதல் அளிக்கப்பட்ட கேள்விகளை தனியாக அமரவைத்து கேட்போம். இதற்கு சுமார் 30-45 நிமிடங்கள் ஆகும் முடிவுகளை அல்லது கருத்துக்களை வெளியிடும்போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆய்வின் முடிவுகளை ஆராய்ச்சியின்போது அல்லது ஆராய்ச்சியின் முடிவின் போது தங்களுக்கு அறிவிக்கப்படும் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆராய்ச்சியிலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

ஆராய்ச்சியாளரின் கையொப்பம் **பங்கேற்பாளர் கையொப்பம்**

நாள்:_____ நாள்:_____

பாதுகாவலர் கையொப்பம்

நாள்:_____

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராய்ச்சியின் தலைப்பு-

பைபோலார் எனும் மனநோய் மற்றும் மதுபழக்கம் உள்ளவர்களுக்கு உள்ள தனிமனித சுபாவங்கள், நோயின் தண்மை மற்றும் செயல்பாடு பற்றி ஆராய்தல்

பங்குகொள்வரின் பெயர்:

ஆராய்ச்சி செய்பவரின் பெயர்: மரு. அகல்யா. டி

மருத்துவ நிலையம்: அரசு மனநல காப்பகம், சென்னை

_____எனும் நான் எனக்கு கொடுக்கப்பட்ட தகவல் தாளினை படித்து புரிந்துகொண்டேன். நான் 18 வயதை கடந்திருப்பதால் என்னுடைய சுய நினைவுடனும் மற்றும் முழு சுதந்திரத்துடனும் இந்த ஆராய்ச்சியில் என்னைச் சேர்த்துக்கொள்ள சம்மதிக்கிறேன். நான் எனக்கு கொடுக்கப்பட்ட தகவல் தாளினை படித்து புரிந்துகொண்டேன். எனக்கு இந்த ஆராய்ச்சியின் ஒப்புதல் படிவம் விளக்கப்பட்டது.

எனக்கு இந்த ஆராய்ச்சியின் நோக்கமும், விவரங்களும் விளக்கப்பட்டது.

எனக்கு என்னுடைய உரிமைகளை பற்றி விளக்கப்பட்டது.

நான் இதுவரை எடுத்துக்கொண்ட அணைத்து மருத்துவ முறைகளைப் பற்றி தெரிவித்திருக்கிறேன்.

இந்த ஆராய்ச்சியில் இருந்து நான் எந்நேரமும் பின் வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் எற்படாது என்பதையும் நான் புரிந்துகொண்டேன்.

என்னை பற்றிய எந்த தகவல்களும் அடையாளமும் வெளியிடபட மாட்டாது என்பதை நான் புரிந்துகொண்டேன்.

என்னுடைய முழு சுதந்திரத்துடனும் இந்த ஆராய்ச்சியில் என்னைச் சேர்த்துக்கொள்ள சம்மதிக்கிறேன்.

பங்கேற்பாளர் பெயர் மற்றும் கையொப்பம்:_____&_____
நாள்:_____

பாதுகாவலர் பெயர் மற்றும் கையொப்பம்: _____&_____
நாள்:_____

ஆராய்ச்சியாளரின் பெயர் மற்றும் கையொப்பம்:_____&_____
நாள்:_____

INFORMED CONSENT FORM

Title of the study: To determine the personality traits, clinical characteristics and cognitive functions in bipolar disorder patients with comorbid alcohol use disorders

Name of the Participant: **Name of the Investigator:** Dr. AHALYA .T

Name of the Institution: Institute of Mental Health,Chennai

Documentation of the informed consent:

I _____ have read the information in this form. I was free to ask any questions and they have been answered. I am over 18 years of age and, exercising my free power of choice, hereby give my consent to be included as a participant in **"To determine the personality traits, clinical characteristics and cognitive functions in bipolar disorder patients with comorbid alcohol use disorders".**

1. I have read and understood consent form and the information provided to me.
2. I have been explained about the nature of the study.
3. I have been explained about my rights and responsibilities by the investigator.
4. I have been informed the investigator of all the treatments I am taking or have taken in the past_____ months including any native [alternative] treatment.
5. I am also aware that the investigator may terminate my participation in the study at any time, for any reason, without my consent. *****
6. I hereby give permission to the investigators to release the information obtained from me as a result of participation in this study to the regulatory authorities, Govt. agencies, and IEC. I understand that they are publicly presented.
7. I have understood that my identity will be kept confidential if my data are publicly presented
8. I have had my questions answered to my satisfaction.
9. I have decided to be in the research study.

I am aware that if I have any question during this study, I should contact the investigator. By signing this consent form I attest that the information given in this document has been clearly explained to me and understood by me, I will be given a copy of this consent document.

For adult participants:

Name and signature / thumb impression of the participant [or legal representative if participant incompetent]

Name_____ Signature_____

Date_____

Name and Signature of impartial witness [required for illiterate patients]:

Name_____ Signature_____

Date_____

Name and Signature of the investigator :

Name_____ Signature_____

Date_____

S.No.	Cases/ controls	Age	sex	Education in completed years	occupation	SES	Marital status	domicile	language	religion	Age of onset of illness in years	duration of illness in years	no. of hospitalizations	total No. of episodes	No. of manic/ hypomanic episodes	No. of depressive episodes	No. of mixed episodes	Duration of longest episode in months	No. of suicide attempts	age of onset of alcohol use in years	duration of alcohol use in years	current use-abuse/ dependence	Audit scores	SAD Q scores	Neurotism	Extraversion	openess to Experrience	Agreeableness	Conscien-tiousness	similarities	lexical fluency	motor luria conflicting instructions	go-no-go	prehension	FAB Total score	stroop effect in sec	DSST in sec	N 1 back- hit	N 2 back-hit	N 1 back- error	N 2 back-error
1	BPD & AU	30	M	8	unskilled	lower mi	never marrie	semiurban	tamil	hinduism	29	2	2	2	2	0	0	60	0	17	13	dependenc	22	32	30	23	35	30	28	3	3	3	2	2	3	16	229	299	8	7	2	5
2	BPD & AU	34	M	10	skilled	lower mi	never marrie	urban	telugu	hinduism	21	14	4	4	3	0	1	60	1	23	11	dependenc	20	30	40	25	35	25	26	3	2	1	2	2	3	13	306	364	8	7	2	5
3	BPD & AU	39	M	8	unskilled	lower	married & st	semiurban	tamil	hinduism	22	17	5	10	8	1	1	90	2	18	21	dependenc	20	30	46	23	30	30	32	2	2	1	1	0	3	9	352	421	8	6	2	5
4	BPD & AU	36	M	12	unemploye	lower	married & st	rural	tamil	hinduism	22	14	4	8	6	1	0	30	0	22	14	dependenc	16	28	44	21	32	32	34	3	2	2	1	3	13	320	399	8	6	2	5
5	BPD & AU	24	M	12	skilled	middle	married & st	urban	tamil	hinduism	22	2	2	2	1	1	0	60	1	15	9	dependenc	22	34	30	16	34	28	35	2	2	1	1	0	2	8	329	381	8	6	2	6
6	BPD & AU	24	M	8	unskilled	lower	never marrie	urban	tamil	hinduism	23	1	2	2	1	0	1	90	0	15	9	dependenc	21	30	32	18	30	24	26	2	2	2	1	2	11	289	372	8	7	1	5
7	BPD & AU	39	M	12	clerical	middle	married & st	semiurban	tamil	hinduism	23	16	4	7	4	2	1	60	2	15	24	dependenc	18	28	22	23	24	25	27	3	1	2	2	2	3	13	292	381	8	6	2	4
8	BPD & AU	40	M	8	unemploye	lower	separated/ d	semiurban	tamil	hinduism	25	14	2	10	6	2	2	180	2	15	27	dependenc	20	48	32	24	32	33	35	2	1	1	1	0	2	7	374	401	8	5	2	6
9	BPD & AU	24	M	8	unskilled	lower mi	never marrie	semiurban	tamil	hinduism	18	6	5	5	4	0	1	120	0	22	2	abuse	9	15	25	26	32	26	29	2	2	2	3	2	3	14	299	356	8	7	2	5
10	BPD & AU	37	M	8	unemploye	lower	separated/ d	semiurban	tamil	hinduism	31	6	2	6	5	1	0	60	0	34	3	dependenc	19	33	36	22	38	35	33	3	2	2	2	1	2	12	302	366	8	7	2	5
11	BPD & AU	42	M	8	unskilled	lower	separated/ d	urban	tamil	christian	34	8	2	3	2	0	1	30	1	18	14	dependenc	16	31	44	21	40	27	31	2	2	2	2	1	2	11	312	342	8	7	1	5
12	BPD & AU	24	M	8	unskilled	lower	never marrie	semiurban	tamil	hinduism	21	3	1	1	1	0	0	60	0	18	6	abuse	9	14	28	26	32	25	27	3	2	2	2	2	3	14	265	324	9	7	0	2
13	BPD & AU	36	M	12	skilled	middle	never marrie	urban	tamil	hinduism	22	14	4	6	5	0	1	90	0	23	13	dependenc	21	38	42	22	36	28	33	2	2	3	2	1	3	13	310	397	8	6	2	4
14	BPD & AU	41	M	8	skilled	lower mi	married & st	urban	tamil	hinduism	31	10	8	8	6	0	2	30	0	15	25	dependenc	18	28	29	23	35	25	26	2	2	2	1	2	2	11	314	389	8	6	1	5
15	BPD & AU	27	M	8	unskilled	lower	never marrie	rural	tamil	hinduism	25	2	1	2	2	0	0	15	0	23	4	abuse	10	14	28	18	38	29	35	3	2	3	2	2	3	15	231	302	9	8	1	1
16	BPD & AU	26	M	10	unskilled	lower mi	never marrie	semiurban	tamil	hinduism	23	3	2	2	1	1	0	30	0	24	2	abuse	8	12	32	21	36	27	31	3	2	2	3	2	3	15	220	287	9	8	0	2
17	BPD & AU	35	M	9	skilled	lower mi	never marrie	urban	tamil	hinduism	32	3	1	2	2	0	0	30	0	26	9	dependenc	24	48	31	19	42	31	37	1	2	2	2	1	2	10	278	356	8	7	2	5
18	BPD & AU	41	M	8	unemploye	lower	married & st	urban	tamil	hinduism	16	25	4	5	4	0	1	90	1	21	20	dependenc	28	52	46	22	39	29	35	1	2	1	1	1	2	8	327	402	7	5	3	6
19	BPD & AU	42	M	12	professiona	middle	separated/ d	semiurban	tamil	hinduism	26	16	3	5	5	1	0	180	0	31	11	dependenc	15	26	38	26	34	33	35	2	1	2	1	0	2	8	316	399	8	6	1	4
20	BPD & AU	44	M	9	unemploye	lower	married & st	urban	tamil	hinduism	27	17	2	5	5	0	0	60	0	25	19	abuse	11	14	31	25	28	26	29	2	2	3	2	1	3	15	243	322	9	7	0	1
21	BPD & AU	36	M	12	unskilled	lower mi	married & st	urban	tamil	hinduism	22	14	3	4	3	1	0	90	2	23	13	abuse	9	15	27	22	30	35	33	3	2	3	2	2	3	15	254	319	8	6	1	4
22	BPD & AU	34	M	8	unskilled	lower	never marrie	rural	tamil	hinduism	23	11	2	4	2	1	1	60	0	19	15	dependenc	22	48	33	24	34	30	32	2	1	1	1	1	2	8	303	376	8	7	2	4
23	BPD & AU	39	M	12	clerical	middle	married & st	semiurban	tamil	hinduism	22	17	3	6	3	2	1	90	2	19	20	dependenc	19	34	25	23	39	30	32	2	1	1	1	0	3	8	324	412	8	5	2	5
24	BPD & AU	33	M	8	unskilled	lower	separated/ d	urban	tamil	hinduism	31	2	1	2	2	0	2	30	1	25	8	abuse	8	14	26	21	34	30	28	2	2	2	2	2	2	12	220	302	9	8	0	1
25	BPD & AU	45	M	8	unemploye	lower	married & st	rural	tamil	hinduism	20	25	3	8	6	1	1	60	0	25	20	abuse	9	15	29	22	38	25	26	2	2	2	2	1	2	11	265	334	9	7	1	2
26	BPD & AU	38	M	8	unskilled	lower	married & st	semiurban	tamil	hinsuiam	24	14	2	4	3	1	0	90	1	18	20	dependenc	24	48	38	25	32	30	32	2	2	2	1	1	3	11	298	377	8	5	2	5
27	BPD & AU	50	M	8	unskilled	lower	married & st	urban	tamil	christian	26	24	7	10	7	0	2	90	1	26	24	dependenc	28	52	44	26	36	32	34	1	1	1	1	0	2	6	364	392	8	5	2	4
28	BPD & AU	47	M	12	unemploye	lower	separated/ d	rural	tamil	hinduism	30	17	2	6	5	1	0	30	0	22	25	dependenc	30	56	44	20	35	28	35	2	1	1	2	1	2	9	319	367	8	6	2	3
29	BPD & AU	48	M	10	unskilled	lower	separated/ d	urban	tamil	hinduism	25	23	3	7	6	1	0	90	1	28	20	dependenc	28	50	42	19	33	24	26	2	2	1	1	1	2	9	322	381	8	5	3	4
30	BPD & AU	34	M	8	unskilled	lower	married & st	urban	tamil	hinduism	30	4	1	2	2	0	0	30	0	24	10	dependenc	32	54	40	24	35	25	27	2	2	1	1	1	2	9	302	376	8	6	2	4
31	BPD & AU	42	M	8	unemploye	lower	separated/ d	semiurban	tamil	hinduism	26	16	3	5	4	1	0	180	0	31	11	dependenc	22	44	38	16	37	33	35	2	2	1	1	0	2	8	334	412	7	5	3	6
32	BPD & AU	52	M	10	unskilled	middle	married & st	urban	tamil	hinduism	25	27	2	5	3	1	1	30	0	26	26	dependenc	16	28	32	20	36	26	29	1	1	2	1	1	2	8	289	361	8	5	2	5
33	BPD & AU	36	M	12	skilled	lower	married & st	urban	tamil	hinduism	24	12	3	6	4	2	0	45	0	20	16	abuse	9	14	29	21	34	35	33	3	2	2	2	3	14	245	317	8	6	1	4
34	BPD & AU	34	M	8	unskilled	lower	never marrie	rural	tamil	hinduism	30	4	1	2	2	0	0	60	0	19	15	dependenc	32	52	38	19	40	27	31	2	1	2	2	1	2	10	233	302	8	6	2	6
35	BPD & AU	39	M	13	skilled	middle	married & st	semiurban	tamil	hinduism	32	7	3	6	4	2	0	45	1	15	17	dependenc	18	32	34	22	38	30	32	2	2	2	2	1	3	12	286	382	7	5	3	6
36	BPD & AU	27	M	8	unskilled	lower	never marrie	rural	tamil	hinduism	25	2	1	2	2	0	0	15	0	23	4	abuse	10	14	28	18	38	29	35	3	2	3	2	2	3	15	231	302	9	8	1	1
37	BPD & AU	26	M	10	unskilled	lower mi	never marrie	semiurban	tamil	hinduism	23	3	2	2	1	1	0	30	0	24	2	abuse	8	12	32	21	36	27	31	3	2	2	3	2	3	15	220	287	9	8	0	2
38	BPD & AU	44	M	9	unemploye	lower	married & st	urban	tamil	hinduism	27	17	2	5	5	0	0	60	0	25	19	abuse	11	14	31	25	28	26	29	2	2	3	2	1	3	15	243	322	9	7	0	1
39	BPD & AU	36	M	12	unskilled	lower mi	married & st	urban	tamil	hinduism	22	14	3	4	3	1	0	90	2	23	13	abuse	9	15	27	22	30	35	33	3	2	3	2	2	3	15	254	319	8	6	1	4
40	BPD & AU	33	M	8	unskilled	lower	separated/ d	urban	tamil	hinduism	31	2	1	2	2	0	2	30	1	25	8	abuse	8	14	26	21	34	30	28	2	2	2	2	2	2	12	220	302	9	8	0	1
41	BPD & AU	45	M	8	unemploye	lower	married & st	rural	tamil	hinduism	20	25	3	8	6	1	1	60	0	25	20	abuse	9	15	29	22	38	25	26	2	2	2	1	2	1	11	265	334	9	7	1	2
42	BPD & AU	38	M	8	unskilled	lower	married & st	semiurban	tamil	hinsuiam	24	14	2	4	3	1	0	90	1	18	20	dependenc	24	48	38	25	32	30	32	2	2	2	1	1	3	11	298	377	8	5	2	5
43	BPD & AU	50	M	8	unskilled	lower	married & st	urban	tamil	christian	26	24	7	10	7	0	2	90	1	26	24	dependenc	28	52	44	26	36	32	34	1	1	1	1	0	2	6	364	392	8	5	2	4
44	BPD & AU	47	M	12	unemploye	lower	separated/ d	rural	tamil	hinduism	30	17	2	6	5	1	0	30	0	22	25	dependenc	30	56	44	20	35	28	35	2	1	1	2	1	2	9	319	367	8	6	2	3
45	BPD & AU	42	M	8	unemploye	lower	separated/ d	semiurban	tamil	hinduism	26	16	3	5	4	1	0	180	0	31	11	dependenc	22	44	38	16	37	33	35	2	2	1	1	0	2	8	334	412	7	5	3	6
46	BPD & AU	52	M	10	unskilled	middle	married & st	urban	tamil	hinduism	25	27	2	5	3	1	1	30	0	26	26	dependenc	16	28	32	20	36	26	29	1	1	2	1	1	2	8	289	361	8	5	2	5
47	BPD & AU	36	M	12	skilled	lower	married & st	urban	tamil	hinduism	24	12	3	6	4	2	0	45	0	20	16	abuse	9	14	29	21	34	35	33	3	2	2	2	2	3	14	245	317	8	6	1	4
48	BPD & AU	34	M	8	unskilled	lower	never marrie	rural	tamil	hinduism	30	4	1	2	2	0	0	60	0	19	15	dependenc	32	52	38	19	40	27	31	2	1	2	2	1	2	10	233	302	8	6	2	6
49	BPD & AU	39	M	13	skilled	middle	married & st	semiurban	tamil	hinduism	32	7	3	6	4	2	0	45	1	15	17	dependenc	18	32	34	22	38	30	32	2	2	2	2	1	3	12	286	382	7	5	3	6
50	BPD & AU	27	M	8	unskilled	lower	never marrie	rural	tamil	hinduism	25	2	1	2	2	0	0	15	0	23	4	abuse	10	14	28	18	38	29	35	3	2	3	2	2	3	15	231	302	9	8	1	1
51	BPD	42	M	8	skilled	middle	married & st	urban	tamil	hinduism	25	17	1	2	2	0	0	30	0	0	0	0	0	0	22	23	25	30	33	3	2	3	2	2	3	15	198	278	8	5	2	6
52	BPD	25	M	8	unskilled	lower	never marrie	semiurban	tamil	hinduism	19	6	3	4	4	0	0	180	0	0	0	0	0	0	18	26	30	35	26	3	2	3	2	1	3	14	232	310	8	7	2	5
53	BPD	29	M	10	skilled	lower mi	married & st	semiurban	tamil	hinduism	25	4	1	2	2	0	0	45	0	0	0	0	0	0	25	21	32	30	32	2	2	3	2	2	3	14	195	285	8	7	2	5
54	BPD	19	M	8	unskilled	lower	never marrie	semiurban	tamil	hinduism	17	2	2	2	2	0	0	180	0	0	0	0	0	0	28	23	34	32	34	2	2	3	3	2	3	15	208	299	8	7	1	5
55	BPD	28	M	8	unemploye	lower	separated/ d	urban	tamil	hinduism	22	6	1	3	2	1	0	30	1	0	0	0	0	0	23	22	29	28	35	3	1	2	2	2	3	13	202	292	9	7	0	2
56	BPD	25	M	8	unskilled	lower	never marrie	semiurban	tamil	hinduism	19	6	3	4	4	0	0	180	0	0	0	0	0	0	20	26	32	24	26	3	2	2	1	2	3	15	215	302	8	6	2	4

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